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IRON AND ITS CONSTITUENTS IN REGARD TO PHARMACEUTIC PREPARATIONS.

By Henry G. Debrunner, Chemist.

It may be deemed excusable for a Pittsburgher to entertain a very high opinion of iron, and if a Pittsburgh chemist particularly dwells on this subject it can hardly be taken amiss. When we consider that this element is one of the chief constituents of the earth's solid crust, varying in quantities from two to ten per cent. in the primary rocks, besides its general presence throughout the animal and vegetable kingdoms, a closer examination of its character will be justifiable. The manifold useful applications of iron in the arts and manufactures, its occurrence in numerous ores and minerals, in the green pigment of plants and the red one of blood; its presence even in the sun and the far distant fixed stars, where it has been detected by aid of the spectroscope, render it an article of universal interest.

When making ferruginous preparations, which are used in considerable quantities on account of their great therapeutic value, it is the aim of the pharmacist to procure the purest iron in the market. Chemically pure iron (Fe) is not an ordinary commercial article. The finest Pittsburgh tool steel, which fully equals, if not surpasses, the best of Sheffield make, contains, besides combined carbon, 0·05 per cent. of silicon, 0·008 per cent. of phosphorus, 0·006 per cent. of sulphur, 0·1 to 0·2 per cent. of manganese, and minute traces of various other elements, while cast iron contains from 88 to 97 per cent. of pure Fe and a high percentage of manganese.

The Pharmacopœia recommends iron wire as material for iron preparations; musical wire, being steel and therefore purer, is also often applied and will yield sufficiently pure preparations. Their analyses are as follows:

	Iron wire.	Musical (steel) wire.
Carbon,	0·2730 per cent.	0·5320 per cent.
Silicon,	0·1418	0·0700
Phosphorus,	0·0809	0·0427
Sulphur,	0·0610	0·0182
Manganese,	0·7027	0·0600
Copper, trace.		
Iron (Fe),	98·7406	99·2771
	100·0000	100·000

(Quantity taken for analysis, 20 grams.)

The material I would recommend is soft steel drillings, they being cheaper, purer and not so difficult to dissolve as wire, which by the different mechanical processes of forging, hammering, rolling and final drawing has become denser and harder. The more impure an iron the quicker it will dissolve, but the same piece of iron or steel will more rapidly dissolve the less it has undergone the above-mentioned mechanical treatments. If we consider the immense amount of mechanical labor to which an iron or steel bar is subjected until its diameter is reduced to that of wire, it is evident that soft steel drillings, shavings or turnings deserve preference. Axles and steel boiler plate, of which turnings and drilling can easily be obtained at any steel work or machine shop, rank among the purest brands of iron, in the chemical sense of the word. Their composition is shown by the following analysis:

	Axle.	Boiler plate.
Carbon, combined,	0·2700 per cent.	0·3010 per cent.
Silicon,	0·0800	0·0492
Phosphorus,	0·0382	0·0298
Sulphur,	0·0157	0·0163
Manganese,	0·0747	0·0643
Iron (Fe),	99·5214	99·5394
	100·0000	100·0000

(Quantity taken for analysis, 20 grams.)

It may be considered a practical rule that any brand of steel that will make good axle or boiler plate will also yield pure preparations on dissolving.

Let us examine, now, what becomes of the different constituents of iron on dissolving it in different acids.

If iron is acted on by hydrochloric acid the following reaction will take place: $Fe+2HCl=FeCl_2+H_2$. Combined carbon is chiefly carried off in the form of a hydrocarbon, while the entire graphitic

portion is left in the black insoluble residue. Iron phosphide is similarly decomposed, particularly on heating the solution, forming phosphoretted hydrogen. Silicon partially may undergo the same reaction, the larger quantity of this element, however, will be found in the black carbonaceous residue. Sulphur, if not combined with copper and arsenic, will be entirely eliminated as gaseous combinations, while manganese and iron remain in solution as chlorides. If copper is present among the impurities of iron, it will combine with the sulphur, forming copper sulphide, which will be found in the insoluble residue. Silicic acid from slag particles, pre-existing in the material used, may be detected in minute quantities, on oxidation and evaporation of the resulting solution to dryness, etc. If steel has been used, slag particles are absent. It is evident that from a pure iron these impurities are of no significance; when, however, pig iron or other impure brands are used, they may cause precipitates in a concentrated solution. Drillings of soft steel, containing 99 per cent. of iron (Fe), combine at the same time convenient shape with the highest practical purity. I have often had samples which dissolved perfectly in dilute hydrochloric acid without the application of heat. The product of this reaction is an aqueous solution of ferrous chloride, Fe_2Cl_4, which is filtered, and finally converted into ferric chloride, Fe_2Cl_6, by the addition of the necessary quantities of hydrochloric and nitric acids, when the following exchange of molecules will take place: $Fe_2Cl_4+2HCl+2HNO_3=Fe_2Cl_6+2NO_2+2H_2O$.

The action of sulphuric acid on iron is similar to the foregoing, most of the impurities being carried off as gaseous combinations, while the graphitic carbon is left as a black insoluble residue, together with some silicon. Highly concentrated sulphuric acid hardly acts on iron in the cold; but on heating sulphurous anhydrid, SO_2 is formed, while the dilute acid rapidly dissolves it to ferrous sulphate, liberating hydrogen.

The behavior of iron to nitric acid is essentially dependent on the concentration of the latter. Highly concentrated aqua fortis converts iron into its passive state, thus preventing any further reaction. When in this peculiar modification it will neither be acted on by weaker acid, unless touched with another clean piece of metallic iron, when liquefaction and evolution of gas will begin at once. Medium strong acid, of about 1·25 specific gravity, forms ferric nitrate, $Fe_2N_6O_{18}$, on evolution of nitric oxide, NO, which, in contact with atmospheric

air, is oxydized to hypo-nitric anhydrid, N_2O_4, forming red fumes. Very dilute nitric acid, finally, when acting on iron in the cold, transforms it into ferrous nitrate, $Fe(NO_3)_2$, forming at the same time ammonic nitrate by the action of nascent hydrogen on nitric oxide, NO, in presence of nitric acid. The latter gas (NO), if absorbed by the ferrous solution, produces a black coloration of the same. The formation of ammonic nitrate takes place in accordance with the following equation:

$$\underset{\text{Nitric oxide.}}{NO} + \underset{\text{Hydrogen.}}{5H} + \underset{\text{Nitric acid.}}{HNO_3} = \underset{\text{Water.}}{H_2O} + \underset{\text{Ammonic nitrate.}}{NH_4NO_3}$$

The lower the temperature during this process, the larger the quantity of ammonic nitrate formed. The different chemical processes which take place when iron is acted on by very dilute nitric acid are illustrated by the following scheme of equations:

a. $$\underset{\text{Iron.}}{Fe} + \underset{\text{Nitric acid.}}{2HNO_3} = \underset{\text{Ferrous nitrate.}}{Fe(NO_3)_2} + \underset{\text{Hydrogen.}}{H_2}$$

b. $$\underset{\text{Iron.}}{Fe} + \underset{\text{Nitric acid.}}{8HNO_3} = \underset{\text{Ferrous nitrate.}}{3Fe(NO_3)_2} + \underset{\text{Water.}}{4H_2O} + \underset{\text{Nitric oxide.}}{2NO}$$

These two reactions take place at the same time and are followed by the formation of ammonic nitrate above alluded to. On adding five times the equation *a* to *b*, in the presence of an excess of $2HNO_3$, we obtain

$$\underset{\text{Iron.}}{8Fe} + \underset{\text{Nitric acid.}}{20HNO_3} = \underset{\text{Ferrous nitrate.}}{8Fe(NO_3)_2} + \underset{\text{Water.}}{6H_2O} + \underset{\text{Ammonic nitrate.}}{2NH_4NO_3}$$

thus expressing the different chemical reactions in one equation.

The nature of the reddish-brown flocculent body which is formed from the combined carbon is not yet sufficiently investigated. Its ability of producing lighter and darker colorations of the ferric solution, proportionately to its quantity, forms the basis of Eggertz's colorimetric method for its estimation in steel. The results agree to 0·02 per cent. with those obtained by combustion analysis.

On dissolving iron by means of iodine, the total quantity of carbon remains in the residue, the resulting solution containing but the iodides of the metallic elements, viz.: ferrous and manganous iodide, the latter in minute quantity. An excess of iodine, however, will also oxidize the non-metallic impurities, as phosphorus, sulphur, etc., by decomposing water and with the formation of hydriodic acid, HI. For the preparation of pure ferric iodide, Fe_2I_6, it is therefore essential to filter the solution of the green ferrous salt, Fe_2I_4, before adding a further quantity

of iodine. As to the carbonaceous residue, it may be stated that it contains chemically combined iodine, and was found by Eggertz to have the following composition, when dried at 212°F.

Carbon, C,	59·69 per cent.
Water, H_2O,	22·50
Iodine, I,	16·00

leaving, on ignition, some siliceous ash.

It is really interesting to observe what an important influence carbon exerts upon the metal iron, the commercial brands of which should be, scientifically, called carburets of iron. "Spiegeleisen," a white crystallized and highly manganiferous cast iron, which is used in large quantities in the Bessemer process, corresponds to the formula Fe_4C_c; it contains its total carbon (about 5 per cent.) in combined condition. In grey pig, the larger portion of this element exists in the graphitic modification, sometimes approximately corresponding to the formula $Fe_8C_c + C_{gr}$. Among the numerous interesting phenomena which these combinations exhibit, I cannot help to mention one which, although being very frequently observed, still lacks a sufficient explanation of its causes. I refer to the process of hardening steel, as practised daily by every blacksmith. If a piece of steel at red heat is dipped into cold water an entire change of its structure takes place; its grain becomes finer and denser, its tensile strength almost double to what it was before, while its hardness nearly reaches that of diamond. Acids will hardly attack it in this state, no edge tool will produce an impression on the bar, which before being subjected to this simple treatment, easily could be drilled or filed. These facts become still more interesting if we know that at the same time the volume of the bar has become larger and its specific gravity decreased. Salt water or mercury will produce a still higher degree of hardness and a larger expansion of the hardened bar, while a soap solution has no hardening effect on steel. None of these phenomena will take place in iron free from carbon, while hardness and tensile strength will proportionately increase with the latter, reaching their "practical maximum" at 1·2 per cent. combined C. This can by no means be called a mere physical change, but seems to be the result of a chemical reaction between the iron and its other constituents. I have previously mentioned that on dissolving iron in hydrochloric acid the combined carbon is carried off as carburetted hydrogen. If, for instance, the gases that form, on treatment of

"Spiegeleisen" with the above acid, are allowed to pass through alcohol or concentrated sulphuric acid, part of them will be absorbed, and may be separated again, on dilution with water, in the form of an oily liquid which is colorless, possesses a strong, rather disagreeable smell, and consists chiefly of the hydrocarbons of the ethylen series, $C_n H_{2n}$. Besides these combinations, the characteristic group $C_{10}H_{16}$ of the volatile oils has also been found to be an admixture of the hydrogen gas liberated in this process. Resinous bodies, very probably products of decomposition of the foregoing compounds, are found in the carbonaceous or siliceous residue on dissolving, and may be extracted by ether or caustic alkalies. Sulphur and phosphorus also give rise to the formation of organic compounds containing these elements.

That the investigation of inorganic bodies may sometimes yield results allowing conclusions on the most complicated organic and physiological processes may be fairly illustrated by the following instance: As many physiologists admit the carbon, isolated from carbonic acid by the green parts of plants, under the influence of solar light, to be able, in its nascent state, to unite with water, forming a carbo-hydrate, it would be a strong support of this theory if a carbo-hydrate could be formed synthetically in the indicated manner and at a low temperature. That this primordial hydrate may form the basis of the numerous other compounds, elaborated by plants on ulterior transformation, is far easier to believe than the above hypothesis, without any experimental support. P. Schützenberger and A. Bourgois first expressed this idea in their "Researches on the Carbon in White Cast Iron," and succeeded in forming a compound, to which they gave the formula $C_{223}H_2O$. It can be constantly obtained by treating Spiegeleisen, Fe_4C, with a cold solution of cupric chloride, when the following reaction will take place: $Fe_4C+4CuCl_2=4FeCl_2+C+Cu_4$. The carbonaceous residue of copper is then treated with cold ferric chloride, to which some hydrochloric acid has been added. Copper will rapidly dissolve, leaving a brownish-black but little bulky residue, which, dried at 212° F., corresponds to the above-mentioned formula, $C_{22}H_6O_3=C_{223}H_2O$.

May I be allowed to conclude this paper with a few remarks on ferrum dialysatum and its analysis. The demand for this new preparation, which doubtless will take the place of most of the other ferruginous compounds, chiefly on account of its almost entire tastelessness,

is continually increasing. A sample, which I prepared according to one of the methods lately published in this journal, gave on analysis:

Ferric oxide, Fe_2O_3,	4·02	4.71
Ferric chloride, Fe_2Cl_6,	0·69	per cent.
Water, H_2O,	95·29	
	100·00	

(Chlorine = 0·45 per cent. combined with 0.24 per cent. iron to form 0 69 per cent. Fe_2Cl_6.)

It possessed all the characteristic properties of the commercial article, leaving on evaporation in the water bath 5·03 per cent. of hydrated ferric oxychloride. The approximate chemical formula derived from the above analysis lets it appear as an aqueous solution of $Fe_2Cl_6 + 12Fe_2O_3$ or $Fe_{26}O_{36}Cl_6$. In order to obtain a very basic oxychloride I consider it necessary to keep the solution to be dialysed, during precipitation, or addition of the separately precipitated and washed ferric oxyhydrate, at as low a temperature as possible. Heating in an open vessel, as well as in hermetically sealed glass tubes, under pressure, will produce a precipitate insoluble on subsequent dialysis.

In order to test the percentage strength of dialysed iron, without evaporating a weighed quantity to dryness or determining ferric oxide and chlorine by weight or volumetric analysis, I would propose the following colorimetric method, which will give quite satisfactory results, particularly if applied to products that have been prepared by exactly the same process. Having obtained a clear, tasteless, dard-red solution, which will not precipitate on addition of silver nitrate,[1] it is removed from the dialyser, and compared with a standard solution of known strength, which has been determined by careful weight analysis. The modus operandi is as follows:

α. The standard solution consists of 10 cc. of dialysed iron (5 per cent.), diluted with distilled water of 60°F. to the volume of 200 cc. Twenty cc. of this solution are then introduced into a true cylindrical tube of 50 to 60 cc. capacity, graduated into 0·1 cc. In order to make the

β. Colometric comparison, 2 cc. of the solution to be tested are put into a similar tube of exactly the same dimensions, and diluted with distilled water until its shade is exactly the same as that of the stand-

[1] On addition of silver nitrate I have observed dichroism of said solution. It appears turbid in the reflected, but perfectly clear in transparent light.

ard. To produce a perfect mixture, the tube is shaken after every addition of water. If the standard solution has been prepared from dialysed iron, leaving exactly 5 cc. of residue on evaporation on the water bath, every cc. of the diluted solution of the sample to be compared will correspond to $\frac{1}{4}$ per cent. of residue of the original sample, and its volume expressed in cc., when of equal shade with the standard, divided by four, will give the percentage strength desired.

I have compared results of this colorimetric method with those of weight and volumetric analysis, and find it correct to 0·05 per cent. In the following I will give a few examples to illustrate the method proposed:

Standard: $\frac{20 \text{ cc.}}{4} = 5$ per cent. residue.

1. Sample compared was to be diluted to 18 cc. to equal shade of standard. $\frac{18 \text{ cc.}}{4} = 4\frac{1}{2}$ per cent. residue.

2. Sample compared was to be diluted to 23 cc. to equal shade of standard. $\frac{23 \text{ cc.}}{4} = 5\frac{3}{4}$ per cent. residue.

From these data, we easily can calculate to what volume any quantity of dialysed iron is to be evaporated or diluted to obtain the desired strength of 5 per cent.[1] As this mode of analysis only requires a few moments time, being at the same time sufficiently correct for practical purposes, it may be preferable to that of evaporation.

Black Diamond Steel Works,
Pittsburgh, Oct. 6, 1877.

ESTIMATION OF QUINIA.

By Henry Trimble, Ph.G.

Read at the Pharmaceutical Meeting, October 16, 1877.

For the ready estimation of quinia, for example in pills, and in many cases in which the quantity that should be present is approximately known, I have devised and used the following method, which is based

[1] As to the necessary glass tubes, I would recommend the same as used in the laboratories of steel works for colorimetric carbon determinations, viz.: Two true cylindrical tubes, closed at one end; capacity 50 to 60 cc., graduated into 0·1 cc., internal diameter about three-eighths of an inch; both exactly of the same dimensions and of best white glass.

on the intensity of color produced when the alkaloid is treated with chlorine water and solution of ammonia.

First a standard solution is prepared by taking one centigram of quinia or one of its salts, dissolving it in about five cc. of fresh chlorine water, adding ten cc. of solution of ammonia, and diluting this dark-green liquid in a glass cylinder to 100 cc.

In estimating a one-grain quinia pill, for example, a similar cylinder is taken, into which is placed a fractional part of the solution obtained by treating the disintegrated pill with chlorine water and ammonia, and diluting with water until it exactly corresponds in color with the standard solution; then by a little calculation the amount of quinia is known. By a little practice the results become surprisingly accurate, and the process requires very little time compared with the more exact gravimetric methods. It is true that quinidia if present interferes with the results, but it is not so liable to be fraudulently employed as the cheaper alkaloids.

To what extent this process may be employed for the estimation of quinia and quinidia in bark I am not prepared to say, but think that, with certain precautions, it might admit of application for this purpose. The same principle is extensively used in determining the amount of carbon in iron and steel, with very satisfactory results.

The PREPARATION of CONCENTRATED NITRIC ACID.

By Henry Trimble, Ph.G.

Read at the Social Alumni Meeting, October 4, 1877.

Although this acid is rarely used in pharmaceutical laboratories of greater strength than the Pharmacopœia standard, yet occasionally that of the specific gravity 1·5 is found convenient, and in some operations absolutely necessary.

All the authorities which I have consulted on the subject, recommend it to be prepared by heating in a retort equal parts of potassium nitrate and sulphuric acid. This process requires a high heat, constant attention, and is very liable to terminate in fracture of the retort. The following method, I understand, is employed in some of the German laboratories, and, having tried it a great many times myself, I think it should be recommended, supposing that commercial nitric acid is as readily procured as potassium nitrate.

One part of commercial nitric acid is placed in a retort, to which has been closely attached a suitable receiver, and two parts of strong sulphuric acid added. The whole is placed on a wire gauze, over a Bunsen burner flame, not larger than that of an ordinary candle. In about eight or ten hours all the nitric acid will have distilled over, leaving the sulphuric acid in the retort, which, though slightly diluted by the water absorbed, may be used in a variety of ways.

The operation requires very little attention, and the resulting bright-yellow nitric acid is extremely active on many substances, but, being liable to slight decomposition, is better prepared only when wanted for immediate use.

HOP CULTURE IN NEW YORK.

By Emery Gilbert Bissell, Ph.G.

(*From an Inaugural Essay.*)

Hop culture in the United States was commenced in Virginia about 250 years ago, and in 1657 the industry was encouraged by legislative enactments. The culture of the crop in that State was not a success, the quality produced being far inferior to that of the old world. After the failure to produce a good quality in Virginia little attention was paid to the growing of hops in this country until within the last seventy-five years, and the most we can learn from census reports is that they have been grown, more or less, in nearly every State and Territory in the Union—Florida, Dakota and New Mexico being the only exceptions. It is within the past thirty-five years that hops have assumed their present commercial and agricultural importance in the United States, and during that time the culture has increased at a surprising rate, while in England and Germany the increase has been very slight during the past seventy-five years. Some idea may be formed of the growth and importance of this interest in the United States from the following statistics, taken from the census reports, which, allowing 200 pounds to the bale, show that there were produced in this country in 1840 6,196 bales; 1850, 17,485 bales; 1860, 54,960 bales; 1870, 127,283 bales. Thus far New York has led all other States in this branch of agriculture; probably at least four-fifths of all the hops ever grown in this country have been produced in New York. In certain sections of the State the crop is the chief one of the farmer, and the sale of it the leading business of the community. In the year

1860 the counties of Oneida, Madison, Otsego and Schorhaire are said to have each produced more hops than were grown in the United States outside of New York. In 1875 the two counties Oneida and Madison produced something over 40,000 bales, probably about one-third the entire crop of the country. The exports from the port of New York, year ending Aug. 31st, were, in 1869, 69,463 bales; 1870, 56,453 bales; 1871, 24,577 bales; 1872, 6,095 bales; 1873, 9,315 bales; 1874, 1,638 bales; 1875, 15,995 bales; 1876, 46,116 bales. The imports to the port of New York, year ending Aug. 31st, were, in 1869, none; 1870, none; 1871, none; 1872, 5,800 bales; 1873, 20,885 bales; 1874, 13,444 bales; 1875, none; 1876, none.

The American hop is of fine quality, indeed it is claimed that when our hops are properly picked and dried, no country produces a finer article. The quality of hops can be readily determined by their general appearance, odor and amount of lupulin contained in them, the best being free from rust or mould, the bracts of a bright yellowish-green color, and showing none of the dark spots produced by the hop-leaf louse (Apis Humuli). The odor of hops is peculiar, powerful and penetrating, yet to most people agreeable; it is due to a volatile oil. In judging of hops little or no attention is paid to their taste. Climate appears to have as much influence on the hop crop as soil. A hot, scorching sun is unfavorable, because it causes the strobiles to dry before maturity. It has been observed that favorable weather for corn is not the best for hops; thus in the fall of 1875 the corn crop of central New York was much smaller than usual, while the yield of hops was unusually large. Damp, muggy weather is very unfavorable, causing the strobiles to mould, particularly if they have been damaged by the hop-leaf louse. Temperate weather and a clear atmosphere are the climatic requisites for a successful cultivation of the crop.

Two varieties of the hop are principally grown in New York, being known as the large and small cluster. No particular difference is to be seen in these two varieties, excepting the one is larger than the other, and no difference is known in quality. Besides these two varieties, a third, known as the Palmer Seedling, is now coming into quite extensive cultivation. This variety was first obtained from the seed, by the late Charles Palmer, of Waterville, N. Y., some twelve or fourteen years ago, and is now under successful cultivation in New York, some of the Western States and in Canada. This variety does

not yield quite as well as the other kinds; no difference, however, is to be noticed in the vine, and the hop itself is of large size and fine quality, hardly to be distinguished from the large cluster. The peculiarity of this hop is that it matures some three or four weeks in advance of the ordinary kinds, thus enabling the grower of them to get his crop into market before the ordinary kinds are fit to pick.

Hops are cultivated, picked, dried and baled in New York after much the same manner as described by Mr. Wm. H. Ramsey in his very interesting paper entitled "Hop Culture in Wisconsin," and published in the "American Journal of Pharmacy," 1875, page 241.

In starting new yards the hills are usually placed seven feet apart one way by eight the other. Some growers, however, place the hills only six feet apart in each direction. As the hop plant does not yield the first year, corn or potatoes are planted among the young vines; the latter crop is the better for the hops, because it gives them more exposure to the sun. The second year the vines are trained on poles or strings prepared for the purpose; two poles are generally used to each hill, but sometimes three are used, and growers who set the hills only six feet apart place but one pole to each hill. The poles are set immediately after grubbing. Close cultivation pays best, and after the poles are set the yards may be tilled nearly every day to advantage; the yard in which not a green thing aside from the hop itself is to be seen being the most productive.

When the vine has grown two or three feet in length, usually about the middle of May, tying is commenced. This work is largely done by women and girls, who at this time go through the yard, and, with strings or rushes cut for the purpose, tie usually two vines to each pole; the remaining vines, of which a dozen or more often spring from a hill, are after a time removed, thus throwing the whole vitality of the plant into the two vines which ascend the pole. The largest of the young vines are among those removed, as they run more to vine and are not as productive as those of a medium size. The tying has to be kept up from time to time, until the vine is well up the pole.

The stringing of hops is of late coming much into vogue. When hops are to be trained in this way they are set out the same as though they were to be poled. To the first row of hills are placed stakes four or five feet in length, pieces of broken poles being generally used for the purpose; to the next row are placed long poles

alternately with stakes; to the third row are placed stakes, as in the first; to the fourth row stakes and poles, as in the second; and so on through the yard. From each stake are run two strings, nearly to the top of the neighboring poles; two vines are usually run on each string, and two on the poles. This kind of training is called tent fashion, from the resemblance of the yard to a series of tents, and is the usual way of training the vine on strings. Other ways have been tried, but this method has thus far proven the most successful. The chief advantage of this method of growing hops is that it is much the cheapest way, only one pole having to be provided where sixteen are used if the hops are poled in the ordinary way. The kind of twine used with the best satisfaction is coarse wool twine; this costs about eleven or twelve cents per pound, and it takes from fifty to sixty pounds to the acre; the stakes used are worth two to four cents each. When hops are poled in the usual way it takes about 1,500 poles to the acre; these cost from about twelve to fourteen cents each. Another advantage claimed in stringing hops is that they are not as liable to be damaged by winds; the strings giving more than poles before the storm, prevents the hops from being whipped together. The vines, however, do not climb the strings quite as readily as poles, and consequently it is more work to keep them tied. Another disadvantage is that they are not quite so conveniently picked as from the poles, and it may be also mentioned that the idea prevails among some growers that the vine trained on strings is not quite as productive.

After hops have got a fair start in the spring the growth of the vine is generally very rapid; a number of vines watched by the writer grew, on an average, more than six inches a day for eight days in succession, and in favorable weather exceptional vines have been known to grow ten to twelve inches in twenty-four hours. But the hop is about the most uncertain crop; the prospects of a yard may be wholly destroyed in a single hour by hail, which proves very destructive to the vine; heavy winds at times lay the poles level with the ground; then may come lice or blight, either of which is liable to destroy the crop in a few days' time: only after picking is well advanced is there a certainty as to what the crop will be.

The hop-leaf louse (Apis humuli) is the great dread of the hop grower; more hops are probably destroyed by this insect than by all other causes combined; indeed growing yards are now scarcely to be

found where the insect does not flourish in considerable numbers. The hops are sometimes destroyed in the burr by this insect, but most generally they enter the strobile after it is formed and nearly ripe, and destroy the hop by piercing the bracts, thus allowing the juice to exude, which together with the excretion of the insect causes the hop to mould, and unless they are very soon picked and dried the inside turns nearly black; the hop then acquires a disagreeable odor, and is rendered entirely worthless.

Blight, or rust, is a disease which attacks the vine generally while the hop is in the burr, and gives it the appearance of having been scorched by fire; the hops on such vines do not fully develop.

Hop picking is usually commenced about Sept. 1st; many of the pickers are brought from neighboring cities, and boarded by the growers who employ them until the hops are gathered, some of the larger growers having at this season a hundred or a hundred and fifty hop pickers to provide for.

The crop is necessarily gathered before entirely ripe, because if left to fully mature on the poles great loss occurs from their being then easily shaken from the vine or whipped to pieces by winds; many growers, however, greatly damage their crop by picking when too green; when this is done, the hop, of course, does not contain its full amount of lupulin, which is the valuable portion; moreover, the roots are much damaged by a too early cutting away of the vine; indeed, it appears that the vine is usually cut away too soon for the good of the root; as in cases where the crop has been so damaged as not to be picked, the vine not being cut away until completely dead, the yield the following year has been found to be unusually large.

Hop picking generally lasts from two to three weeks. The boxes, as fast as they are filled by the pickers, are emptied into sacks; they are then taken and placed in kilns, where they are dried by artificial heat. After drying the hops are pressed, by lever hand-presses, into bales of about two hundred pounds each; they are also pressed into small packages of from ¼ to 1 pound. This is a convenient form for the druggist; but, as far as the observation of the writer goes, most all of the hops put up in this form are of very inferior quality, and many of them entirely worthless; in fact, this method seems to be taken for disposing of utterly worthless hops, which could not be sold, at any price, in any other form.

The actual cost of raising hops is, on an average, about ten cents per pound. Their price is as variable as the crop is uncertain, having ranged within the past few years from the actual cost of production to fifty and even sixty cents per pound; most years the crop brings a price which is remunerative to the grower, and, in fact, the culture of hops, if carried on for a succession of years, is said to pay better than most any other kind of farming.

THE MANUFACTURE OF OIL OF TURPENTINE, ROSIN AND TURPENTINE.

By Isidore Zacharias, Ph. G.

From an Inaugural Essay.

Turpentine is the oleoresin of Pinus palustris and other species of Pinus. This is a large indigenous tree, growing in dry, sandy soils, from the southern part of Virginia to the Gulf of Mexico; it is 60 to 70 feet high, and the diameter of its trunk about 15 or 18 inches for two-third of its height; the leaves are about a foot in length, of a brilliant green color, and united in bunches at the ends of the branches. The manufacture of turpentine was for a long time only carried on in North and South Carolina, but, since the last few years, Messrs. Lippman Brothers, of Savannah, Ga., had their attention attracted by the vast forests of pine trees in Georgia and Florida, and to them is due the credit of having opened a branch of business which is increasing yearly. The number of barrels received the first year were in the neighborhood of 3,850; the receipts for last year amounted to about 28,000 barrels rosin and turpentine.

The mode of extracting the crude turpentine from the trees is as follows: During the fall and winter of the year the trees are, what is termed by manufacturers of turpentine, "boxed," excavations are made into the trunk of the trees about 6 to 8 inches above the roots; the shape of these so called "boxes" are somewhat peculiar, the lower lip is horizontol, the upper arched, the bottom of the "box" is about 5 inches below the lower lip and 8 to 10 below the upper; the capacity of these "boxes" varies between ½ to 1 gallon. In a day or two after the "boxes" are made, the trees are deprived of the bark to the height of about 3 feet above the "box," and also some of the wood is scraped off, in order to allow the so-called *crude* to exude; this is termed

"hacking," the hacks being made in the shape of a letter L, and either closed or open; from this the *crude* begins to flow about the middle of March, runs best during July and August and begins to slacken again in September and October. After the "boxes" are filled the *crude* is dipped out by what they call "turpentine dippers," a peculiarly constructed spoon or ladle, into barrels which are generally made of pine and of a rude construction, or sometimes old lard and other barrels are used. These are then removed to the still, where it is allowed to thicken sufficiently to distil off the oil or *spirits* as it is usually called.

The trees require scraping every 8 or 10 days so as to expose a new surface, the flow of the former hacking being clogged by the congelation of resin; a very slight scrape is all that is necessary to set the *crude* flowing again. The number of "boxes" in a tree depended upon its size. The trees are good for a number of years, though they are hardly fit for use after four or five years, the rosin not being worth much, and its yield of oil of turpentine is very slight. The trees are scraped in some instances for such a number of years that ladders are necessary to hack the tree afresh; therefore, the oleoresin as it flows downwards into the "boxes," becomes somewhat congealed, and some of the oil evaporates so that it must be scraped off; it is then put into barrels and afterwards distilled; it takes about 10 barrels of *crude* to produce 2 barrels of *spirits* and 6 of *rosin*. The flow of the first year is always the best and is therefore called "virgin dip." The next process is

The Distillation of the Oil.—After sufficient *crude* has been collected the barrels are emptied into the still, which generally holds between 12 and 20 barrels. The still is mostly, or perhaps always, made of copper; its shape that of the common copper still, an illustration of which can be seen in Parrish's "Pharmacy," p. 760. The head of the still is connected with the worm, which is contained in a large tank surrounded by water, by a long, wide piece of copper. The still is set in a brick furnace, and, after it has been filled, the dirt, scraps of wood and other impurities are skimmed off, after which the head is adjusted and luted on, then heat is applied, when the oil runs through the worm and is collected in a barrel placed at the bottom of the tank containing the worm. Water is condensed with the oil, but as it flows into the barrel, the water being the heaviest, sinks to the bottom, and the oil is dipped out and emptied into regular spirit barrels in which we find it in

commerce. Water is added from time to time to keep the *crude* in a soft consistence, for when it becomes too thick it takes longer to boil, thereby injuring the product. The water is added through an opening in the still head. After nearly all the oil has been extracted the head of the still is taken off, and a stop-cock, which is situated near the bottom of the still, is opened, and the residue, which is rosin, flows out and passes through three or four large strainers, the bottom one being covered with cotton batting, into a large trough, from where it is dipped into barrels made for that purpose; said barrels contain between 280 and 400 lbs. As stated before, care must be taken to keep sufficient water in the still, otherwise the rosin becomes charred black. The rosin of the first years' dip is the best, and is consequently worth the most; the opaqueness of rosin is caused by too much water being left in the still. The rosin for the first part of the season of the first year's product is very light-colored and transparent, like "window glass." Each succeeding year the color becomes darker, and finally the rosin is black or nearly so, and there is a very small yield of the oil. We often obtain rosin which is very soft, owing to too much of the oil being left to run out with the rosin.

The method of obtaining tar, as practised by the manufacturers, is very simple. A large hole is dug in the ground, in which are placed pieces of pine, one on the other. After a sufficient quantity has been placed therein they are slowly burnt, when the tar exudes and flows through a trench into a trough, where it is ladled out into barrels; in this way it is generally contaminated with chips, dirt, etc. This product is capable of being distilled, when some pyroligneous acid and an oil of tar are obtained, and what is left is pitch.

GOA POWDER AND CHRYSOPHANIC ACID.

By Charles Bullock.

(*Read at the Pharmaceutical Meeting October* 16.)

In asking your attention to the specimens of Goa-powder and chrysophanic acid, I have *nothing new* to communicate regarding them; but as the literature of the subject is somewhat scattered, a *résumé* of what has been already published may not be without interest to those present at this meeting.

The first notice we have of Goa was in 1874, in a paper from Dr.

Fayrer, of Calcutta, which was published in the "Medical Times and Gazette," on the treatment of Indian ring-worm by Goa-powder. Dr. Fayrer states that in the treatment of certain cutaneous diseases he found no remedy as certainly effective as a secret preparation sold in small vials by the chemists of Calcutta and Bombay under the name of "Goa-powder."

In 1875, Dr. J. F. DaSilva Lima describes the Araroba, a tree growing in Brazil, belonging to the leguminosæ as furnishing a powder known in Brazil as Po' de Bahia, and in the province of Bahia as Araroba powder, as a powerful remedy for cutaneous affections. Dr. Lima believes in and endeavors to establish the identity between Goa and Araroba.

In April, 1875, Mr. E. M. Holmes read a paper before the Pharmaceutical Society of Great Britain "On the identity of Goa-powder and araroba or chrysarobin."

In March, 1877, Prof. Attfield showed that chrysarobin contained from 80 to 84 per cent. of chrysophanic acid.

The botanical source of Goa is not certainly known; by some it has been referred to a lichen, by others to a leguminous plant; again, it has been referred to different species of centrolobium and cæsalpinia, growing in Brazil, and which are said to yield large quantities of chrysophanic acid. Cuttings from the plant or tree yielding goa have been sent to the Royal Botanical Gardens at Edinburgh, and in time we will have a more certain knowledge of its botanical source.

As the drug is a product of South America, the question naturally suggests itself how it came to be introduced into Europe by way of India. The solution of the query is to be found in the fact that the commerce of Brazil, when under the control of Portugal, was carried on by the mother-country chiefly between her South American possessions and her colonies in the East, and Goa, on the Malabar coast, was formerly the capital of the Portuguese dominions in India.

Chrysophanic acid, which forms so large a portion of Goa-powder, was discovered by Schrader in 1819. He named it "Resinous yellow of wall lichens" (Parmelia parietina). Messrs. De LaRue and Müller subsequently obtained it from rhubarb-root, in which it forms the yellow coloring matter. It is also found in the yellow-dock and other plants.

Chrysophanic acid dissolves in 1125 parts of 85 per cent. alcohol at

30°C., and in 224 parts of boiling alcohol. It is soluble in ether, glacial acetic acid, amylic alcohol, and in alkaline fluids. In benzole it dissolves freely, and this menstruum is used to abstract it from Goa-powder.

Medical Properties.—In the treatment of cutaneous diseases, such as Tinea circinata, Tinea tonsurans, Mentagra, etc., Goa-powder has been used mixed with acetic acid, and applied with a brush; or, 20 to 80 grains of the powder are mixed with 10 grains of glacial acetic acid, and incorporated into one ounce of ointment.

Dr. Ashburton Thompson has published the result of 319 observations made upon the effects of the internal administration of Goa and chrysophanic acid. As a summary of these observations, Dr. Thompson finds that Goa is emetic and purgative—vomiting is usually the first action unattended, by any depression.

Dose.—On children from 9 to 12 years of age, 6 grains produce no effect; on children from 5 years down this dose is sure to operate, but the time of action may vary from 10 minutes to 12 hours. The effect of the same dose is not increased with diminution of age. With adults a dose of 30 grains operated with tolerable uniformity; the interval elapsing before manifestation of effect was seldom sooner than 20 minutes, and may be as long as 5 hours.

As a conclusion to these extended observations, Dr. Thompson says that "Goa (chrysarobin) in a dose of 20 to 25 grains for an adult, or 6 or more grains for children, is an emetic purge, unattended by any inconvenient symptoms. It is as certain as other medicines which act in the same way."

Chrysophanic acid in a suitable dose (15 to 20 grains) will cause vomiting and purging; if the dose be small, it will vomit only. In this action it is the reverse of Goa, which is likely to purge only in small doses. For children of 10 years or under 6 grains is a dose; like Goa, no increase of effect is produced on younger children by the same dose. On children of less than 4 or 5 years its action is more uncertain than Goa—it fails to act, acts feebly, or vomits only; it never acts with unexpected violence. With adults the action of the acid is pretty certain in doses of 15 grains. Idiosyncrasies require an adjustment of dose of from 8 to 20 grains. Whatever the condition of the patient, it causes the evacuation in one way or the other of large quantities of bile.

The action of the resin of Goa (after the separation of the chrysophanic

acid) is identical with that produced by the powder, but much more powerful. Chrysarobin and chrysophanic acid, when administered in connection with alkalies, have their activity much increased.

Six or 8 grains of chrysophanic acid, followed by a draught containing 15ℳ of liq. potassa, has all the effect of 15 grains of the powder. The action is usually not until the lapse of two hours! This dose, taken at night, does not operate until morning. In such case sickness is always the first effect, but the purging ensues almost immediately afterwards.

ON THE CONSTITUENTS OF PODOPHYLLUM PELTATUM, Lin.

By William Charles A. Busch, Ph.G.

Abstract from an Inaugural Essay.

The resin was prepared by mixing the concentrated tincture

1. *With water.* A turbid liquid was obtained, which after a time produced a light-grey precipitate, completely soluble in ether and alkalies. On being again set aside the turbid liquid settled very slowly, but on the addition of a little muriatic acid it became clear, and the dark-grey precipitate was found to be nearly insoluble in ether, but readily soluble in alkalies.

2. *With acidulated water.* A greyish precipitate was readily obtained which retained its color if dried at the ordinary temperature; a higher temperature deepened the color very perceptibly, and caused the resin to fuse to a blackish-brown mass, which on being dissolved in alcohol and precipitated by cold acidulated water was again obtained as a greyish powder. It was completely soluble in alcohol and alkalies, and partly in ether. On incineration a little ash was left. With hot water a solution was obtained which precipitated on cooling; cold water dissolved a little of the resin, the yellowish color of the solution being discharged by an acid and reproduced with a darker shade by alkalies.

3. *With alum solution.*—A bright-yellow pulverulent precipitate was obtained, which darkened somewhat by hot water, but did not fuse to a brown mass. On incineration an ash was left, consisting mainly of alumina; boiling with dilute hydrochloric acid removed most of it from the resin, which afterwards left but very little ash.

Resin Soluble in Ether.—The officinal resin, obtained by precipitation with water acidulated with muriatic acid, yielded to ether 60 per

cent. of its weight. This portion dissolved in alcohol with a light-brown color; the solution had a bitterish taste, and was precipitated light-greyish by water, bright-yellow by alum solution and orange-yellow by alcoholic solution of lead acetate. All the precipitates dissolve to some extent in hot water, most of the dissolved portion being reprecipitated on cooling. The alum precipitate left 1·25 per cent. of ash, consisting of alumina; the resin obtained by evaporating the ether left no fixed residue.

Resin Insoluble in Ether.—It was found to have a bitter taste and to be soluble in alcohol and alkalies, and slightly so in water. The alcoholic solution became turbid on the addition of water, and very gradually yielded a greyish precipitate; acidulated water produced a similar precipitate, solutions of alum and of acetate of lead somewhat darker, but not yellow precipitates. The bright-yellow color of the resin prepared with alum solution is therefore due only to the resin soluble in ether.

The aqueous solutions of both resins gave no reaction with Mayer's solution, except in one instance; their alkaline solutions were of a yellowish-brown color, when sufficiently diluted with water were not precipitated by acids, and after having been boiled with dilute hydrochloric acid gave no indication of sugar with Trommer's test.

Principles Soluble in Water.—The tincture precipitated with acidulated water yielded a reddish filtrate, of a very bitter taste, and containing sugar, as indicated by Trommer's test. On concentrating the solution, an amorphous bitter mass separated, which dissolved in alcohol, but could not be obtained in a crystalline state.

The filtrate obtained by precipitating with alum solution was likewise bitter, and on being concentrated changed to ruby-red and separated crystals of alum; a blackish, semi-fluid, bitter substance was likewise separated, which was insoluble in ether, carbon bisulphide and petroleum benzin, but dissolved in alcohol and warm water. It was not obtained in a crystallized state.

On mixing the tincture of the rhizome of podophyllum with ether a dark-colored mass separated, which had a very bitter taste, but contained sugar, as indicated by Trommer's test.

LABORATORY NOTES.

Brief abstracts from theses presented to the Philadelphia College of Pharmacy, March, 1877.

Copaiba.—Jos. M. Fulton reports having examined seven commercial specimens of copaiba, which he found free from the adulterations sometimes met with in this drug, such as turpentine, gurjun balsam, castor and other fixed oils. The first two mentioned in the table below were incompletely soluble in a small quantity of absolute alcohol, the remainder dissolved readily therein. On being boiled with water the first four left as residues a hard, the others a more soft resin. The other results are tabulated as follows:

Spec. gr.	31 grains yielded on distillation Vol. oil	Resin	Loss.	Number of drops in 30 cc.	1 gram.	Drops of vol. oil in 20 drops copaiba.	Solidified with magnesia.
·937	21·7	8·5	·8	912	22	22⅛	not
·938	20·	8·7	2·3	880	22	20⅜	not
·950	17·	12·7	1·3	832	21	18⅛	in 10 days
·950	17·5	12·8	·7	816	20	19⅜	" 12 "
·957	11	18·5	1·5	744	20	12½	" 3 "
·960	9·5	20	1·5	720	19	12½	" 2 "
·970	9	20·3	1·7	680	20	10	" 2 "

The copaiba was dropped from a minim measure; 1 gram oil of copaiba yields 35 drops.

Doryphora Decemlineata.—It has been occasionally asserted that the Colorado potato beetle caused blistering of the hands of its captors. These reports induced L. Dembinski to examine the full grown beetle and its larva for cantharidin, the extraction of which was attempted with choloroform and with ether, with negative results.

Citrate of Iron and Quinia.—Oscar Zinn procured six commercial samples of this salt, which were separately dissolved in acidulated water, precipitated by sodium carbonate, the precipitate washed with water, and the dissolved quinia estimated in the filtrate by agitation with ether. Four samples yielded respectively 11·7, 14·4, 14·4 and 15·4 per cent. of this alkaloid, the nature of which was proven by its solubility in ether, and the green color resulting from the action of bromine water and ammonia. The other two samples contained 6 and 9 per cent. of cinchonia, but no quinia.

The same ground was gone over by Henry G. Drueding, who precipitated the solutions of the salt with ammonia, agitated the mixture repeatedly with ether, evaporated the etherial solutions, and weighed the

residue. The six samples were free from cinchonia, the precipitates being completely dissolved in ether. The samples yielded respectively 2, 8, 10, the remaining three 15 per cent. of alkaloid.

Iodide of Potassium.—Five different samples were examined by Eli L. Klopp. They all had an alkaline reaction, were free from bromide and chloride, but with the exception of one, contained traces of iodate.

Tincture and Ammoniated Tincture of Guaiac.—Thos. D. Williams proposes the following modification of the officinal process: Six troyounces of guaiac resin in powder No. 40 are mixed with one and a half pints of alcohol in a half gallon bottle, and set aside in a warm place for 24 hours. The liquid is then poured off, the undissolved portion packed into a funnel, the alcoholic liquid first poured upon it, and the percolation finished with alcohol until two pints of tincture have been obtained. The ammoniacal tincture may be conveniently made in the same manner. The amount of insoluble residue depends upon the purity of the guaiac resin.

Elixir of Hops.—Jno. H. Kinports has found the following formula to yield an agreeable preparation: Hops ℥ii, cloves and anise each gr. lx, cinnamon gr. lxxx, all in fine powder, are mixed and macerated in a portion of the menstruum obtained by dissolving oil of orange f℥iiss in alcohol and water each f℥xii. After 24 hours the powder is firmly packed into a percolator and displaced until 24 fluidounces have been obtained, in which sugar ℥xii is dissolved. Each fluidounce represents 30 grains of hops, the bitter taste of which is nicely blended with the aromatics.

Unguentum Hydrargyri Nitratis.—By John A. Gingrich, Ph. G. Purified ox marrow is recommended as the base for this ointment. The process found to answer best is the one first suggested by Mr. R. Rother, in 1871. The fat is fused, and at a moderate heat treated with one half the nitric acid ordered by the Pharmacopœia, and after the reaction has ceased, the mercury, dissolved in the other half of the nitric acid, is added. Thus prepared it retains its handsome color for a long time.

Unguentum Zinci Oxidi.—Walter W. Kœhler accounts for the difficulties encountered by many in preparing this ointment, by the use of the commercial oxide of zinc, which is often not as smooth and

uniformly fine as it may be obtained by the pharmacist. He suggests to prepare carbonate of zinc in the usual way from sulphate of zinc and carbonate of sodium, to wash the precipitated carbonate thoroughly, and when dry, reduce it to a fine powder. A suitable crucible is then heated to redness, the powder is introduced and after some time stirred two or three times. As soon as a portion of it, when thrown into dilute acid, dissolves without effervescence, the crucible is removed, the powder cooled upon a shallow dish and preserved in well-stoppered bottles. If heated too much or too long, the oxide will be darker and gritty; when properly made it is a yellowish, very fine powder, which may be thoroughly mixed with lycopodium or powdered starch, simply by agitation and without the use of a mortar. It costs but little more than the commercial article, and may be readily made into a perfectly smooth and fine looking ointment. Instead of lard or benzoinated lard the authur prefers a paraffin ointment, made from heavy cylinder oil, by purifying it in the manner indicated in "Amer. Jour. Phar.," 1873, p. 534, and 1874, p. 1.

Preparations of Cubebs.—Louis F. Griffin found that light petroleum benzin (gasolin) dissolves from powdered cubebs 16·5 per cent. of oil and resin, while wax and cubebin are insoluble therein; gasolin would therefore appear to be adapted for preparing an active oleoresin of cubeb. The residue left after preparing tincture of cubeb from four troyounces of the powder yielded to gasolin 115 grains of oleoresin, and the two pints of tincture can therefore contain only 200 grains of the oleoresin. Spirit of nitrous ether, which is used in Mettauer's tincture of cubeb, exhausts it thoroughly.

GLEANINGS FROM THE FOREIGN JOURNALS.

By the Editor.

Tasteless tannate of quinia is prepared by P. J. Haaxman by dissolving 1 part quinia sulphate in acidulated distilled water, and precipitating the alkaloid with soda solution, dissolving it in 10 parts alcohol, sp. gr. ·882, and diluting this solution with warm water so as to remain clear while in the water-bath. This liquid is added gradually, and with continued stirring, to a solution of 3 parts tannin in 60 parts distilled water, the mixture thrown upon a filter, and the precipitate washed with warm water until the filtrate is colorless and free from astringent taste,

whereby the bitter acid tannate is decomposed and the tasteless neutral tannate left upon the filter.—*Jour. Phar. Chim.*, 4th ser., xxv, p. 420.

Adulterated Sulphate of Morphia.—D. B. Dott has met with a sample of this salt, offered in the English market, which contained 34·63 per cent. of anhydrous sodium sulphate.—*Phar. Jour. and Trans.*, August 4th.

Liquor Ferri Albuminati.—Dr. Friese prepares a solution of iron albuminate by mixing the white of one egg with 10 grams liq. ferri sesquichlorati, Ph. Germ., washing the mass well with distilled water, and adding to the insoluble portion 500 grams of distilled water and 12 drops of muriatic acid. An almost complete solution is effected in three days, and is given in doses of a tablespoonful three times a day.—*Phar. Cent. Halle*, No. 31, from *Berl. Klin. Wochenschr.*

Spiritus Ætheris Nitrosi.—For estimating the amount of nitrous ether, Th. Rosenbladt proposes to decompose the ether by caustic potassa, whereby potassium nitrate is formed, which is left behind on evaporation. The residue is transferred to a small flask containing solution of ammonium chloride, and filled with carbonic acid gas. On heating it, ammonium nitrate is formed and then decomposed into water and nitrogen: NH_4NO_2 yields $2H_2O+2N$. The gas is passed over potassa, and the amount of ethylnitrite is calculated from the volume of nitrogen obtained.—*Phar. Zeits. f. Russl.*, No. 9.

Volatile Oil of Storax.—J. H. Vant Hoff corroborates Bertholet's observation that this oil is lævogyre, but finds it due to *styrocamphene*, probably $C_{10}H_{18}O$, of which storax yields only 1-20 per cent.; it boils between 170° and 180°C. and sodifies at about 10°C. Bertholet found the volatile oil to contain *styrolene*, which E. Kopp regards to be identical with *cinnamene*.—*Bull. Soc. Chim.*, 2d ser., xxv, p. 175.

A NEW METHOD OF DETECTING ALCOHOL WHEN USED as an ADULTERANT of the ESSENTIAL OILS.

By Edmund W. Davy, A.M., M.D., M.R.I.A.,
Professor of Forensic Medicine in the Royal College of Surgeons, Ireland.

It is well known that one of the most frequent of the adulterants of the essential or volatile oils, at least of those that are the more expensive, is alcohol; this being the case, at the suggestion of my friend Mr. Charles Tichborne, I made some experiments on the appli-

cation of my molybdenum test for alcohol to the detection of that substance when used for such adulteration, and finding that it might be usefully employed for this purpose, I brought the matter under the notice of the Pharmaceutical Society of Ireland, at its meeting in last April. A number of circumstances, however, prevented me from publishing before this my communication on that subject.

Having briefly described the molybdenum test for alcohol, which was published last year in the "Pharmaceutical Journal," "Chemical News," and in other scientific periodicals, I pointed out how it afforded a very ready means for the detection of alcohol in the essential or volatile oils, it being only necessary to agitate a little of the oil under examination with a small quantity of distilled water, and having allowed the mixture to stand for a short time till the oil and water have again separated, to take a drop or two of the watery portion and add to it three or four drops of a solution of molybdic acid in strong sulphuric acid, when the characteristic blue reaction will appear if alcohol be present. The following very simple way I adopted in applying this test to the essential oils: A glass tube of about four inches in length and of about a quarter of an inch in diameter in its internal bore was taken, one end of which being heated was drawn out to a point, and closed so as still to leave a very small hole, whilst the edges of the other end were merely rounded by fusion,[1] and to this latter was adapted a sound, well-fitting cork, or, better still, an India rubber stopper, capable of closing the aperture perfectly air tight. The small hole being closed by one of the fingers placed firmly against it, the tube is filled to about one-third[2] of its contents with distilled water, and then about an equal volume of the essential oil added. The larger end of the tube is now to be tightly closed with the cork or stopper, the finger being still kept

[1] Several tubes suitable for this purpose may be easily made by selecting a tube of rather soft glass, not too thin in its substance and of about the bore stated, and having with a spirit lamp or by means of gas drawn it out to a fine bore at intervals of about eight or nine inches apart, the tube is cut with a file, both at the centres of contraction and of the intervals between them, and finally the edges of the larger end of each tube rounded and of the smaller one closed to a fine point by fusion.

[2] In cases where the degree of adulteration may be small, it will be well to diminish the proportion of the water employed so as not to dilute the adulterant too much; and where the very expensive oils are the subject of examination, smaller sized tubes than those recommended may be employed.

on the small hole, and the contents of the tube is then strongly agitated for a few moments; after which the pointed end is turned upwards and the finger removed, to allow the air condensed by the closing of the larger end to escape so as to avoid unnecessary loss of the mixture; and finally the tube being again reversed, it is supported on a stand with its pointed end downwards, but not resting on it. In this upright position it is left till the oil has separated from the water and risen to its surface, which in most cases takes place in a comparatively short time, leaving the aqueous portion below quite clear or very nearly so. When such is the case a drop or two of this portion is allowed to escape, which is easily effected, either by pressure on the cork or stopper, by holding the upper part of the tube in the hand so that its warmth may expand the contained air, or by slightly drawing out the cork (which will cause some air to enter at the pointed end) and then pressing it in again; by one or other of those simple means, the necessary quantity of the aqueous portion will be easily forced out of the tube. This on being brought into contact with three or four drops of the molybdic solution placed in a little porcelain capsule or on any white porcelain or delf surface, will, if the oil has been adulterated with alcohol, develop after a few moments the characteristic intense blue reaction of that substance.

The molybdic solution I have employed for this purpose was the same as that which I have already recommended to be used in the adoption of my test for the detection of alcohol generally, which is readily prepared by dissolving, with the aid of a gentle heat, one part of molybdic acid in ten parts by weight of pure and concentrated sulphuric acid. This solution should be kept in a well-stoppered glass bottle, as it quickly absorbs moisture, becoming too dilute, and is otherwise injured if it is left exposed to the air.

As regards the little testing tube I have suggested for the examination of the essential oils, I may observe that if it is properly constructed and corked perfectly air tight, it will hold its contents without allowing it to drop out when not required; and if the pointed end of the tube is not left touching any object, which would withdraw the fluid by capillary attraction, there will only be a veay trifling loss of the watery portion from evaporation through the small aperture, even after keeping for a considerable time.

The experiments I have made on a number of the essential oils,[1] which were apparently pure, or at least were unadulterated with alcohol, show that if they are agitated with distilled water, and after they have again separated from it a drop or two of the watery portion be taken and tested in the manner already described, there will either be no change of color observable, or, what is more frequently the case, there will be a faint light-brown or yellowish-brown tint produced, or lastly, in some few instances a light olive or grey is developed, quickly changing to the former tints, all of which soon fade away, leaving the mixtures colorless or very nearly so. But if the oil is adulterated with alcohol, the water dissolving out that substance, a drop or two of the aqueous portion develops with the test solution, after a few moments, the deep azure-blue coloration which is so characteristic of that substance, and this is much more permanent, generally speaking, than the shades of color caused by the essential oils alone when so treated, though even this, as in their case, will fade away, leaving the mixture colorless, or very nearly so, after a shorter or longer exposure to the air. If the amount of alcohol present be considerable the blue effect will be produced after a few moments, even at the ordinary temperature, but where the quantity is very small I have found that the application of a very gentle heat renders the test far more sensitive.

As, however, I have ascertained that a heat of 212° Fahrenheit, and in some cases a temperature even considerably below that point, especially if continued for some time, will develop a more or less blue coloration with the water which has been agitated along with essential oils apparently pure, when it reacts on the molybdic solution, some caution must be observed in the application of heat.

It appears, however, from my experiments with the essential oils I have operated on, that the water so treated and then allowed to separate from them, as in this method of testing, might be heated with the molybdic solution to 120° Fahr. on a water-bath, without developing a blue coloration, at least, unless that heat is continued for a considerable time, though such a comparatively low degree of heat is quite

[1] The following were the essential oils experimented on: otto of roses, rose geranium, neroli, neroli petit grain, santal wood, rhodium, patchouly, bergamot, verbena, lavender, rosemary, cinnamon, bitter almonds, lemon, bitter orange, cloves, caraway, peppermint, nutmeg, mustard, anise, fennel, cajaput, cubebs, juniper, turpentine.

sufficient to develop, almost immediately, the blue reaction if alcohol be present. But owing to heat acting in the manner described, I would recommend the test to be first applied at the ordinary temperature, and if it fails to indicate the presence of alcohol it shows that either the oil is free from that substance, or if any is present the quantity must be extremely minute, and if the latter is the case it may be readily detected by slightly warming the mixture, taking care, however, that the heat should not rise much beyond 120° Fahr., which, if it occurred, would create some uncertainty as to the cause of the blue reaction.

By means of this test I have ascertained that several samples of otto of roses sold to me as genuine were adulterated with more or less alcohol, and that a sample of rose geranium oil lately in the market, which was assured to Mr. Tichborne as being a genuine article and one of superior quality, was very largely adulterated with alcohol. From several experiments I have made with the more expensive essential oils, mixing them with different proportions of alcohol, I found that where they were mixed with one-twenty-fifth, one-fiftieth, or even with one-hundredth part of their volume of rectified spirit of wine, that its presence could readily be detected by this test, and I have no doubt but that it is capable of detecting much smaller proportions of that substance should it be present as an adulterant in different essential oils.

I should observe, that where the oil from its density will not rise readily to the surface of the water after agitation, as occurs with a few of the volatile oils, this difficulty I have found may be readily overcome by adding to the contents of the tube a little sulphate of magnesia, which, dissolving in the water and increasing its density, will, if employed in sufficient quantity, cause the oil to rise to the surface, leaving the watery portion below clear and suitable for testing with the molybdic solution.

Before concluding I should also remark that the oils themselves must not be added directly to the test solution, for I find that many of them when so treated after passing rapidly through various shades develop a deep blue even though they are apparently pure, and those that do not produce that color give rise to such dark shades of brown, olive or black, as to mask more or less completely any blue coloration which might be caused by admixture with alcohol.

The same I found to be the case to a great extent, though acting

more slowly, when the test solution in a capsule was placed under a small bell glass and exposed for some time to the vapor of different essential oils emanating from cotton wadding on which they had been dropped, or from a little vessel containing them. In some few instances, however, by using the test in this way, it enabled me to distinguish very quickly the pure oil from the same kind which had been mixed with a minute quantity of alcohol, and it may, therefore, in some cases be of use in detecting such adulteration, or at least in distinguishing differences in various samples of the same description of oil; but I found that this way of employing the test, though much simpler, was not so generally applicable, nor so trustworthy in its indications, as the method already described.—*Pharm. Journ. and Trans.*, Sept. 15th, 1877.

ON THE PREPARATION OF DIALYSED IRON.

By E. B. Shuttleworth.

As there appears every possibility that dialysed iron will become quite popular, at least for a time, a few practical directions, unincumbered by unnecessary facts or speculations, may serve a useful purpose.

Many methods and modifications of methods have been proposed for obtaining the solution for dialysis, and most of them may be followed successfully. The object is to prepare a solution tolerably concentrated, fully saturated with ferric hydrate, and containing as little acid as possible. I shall describe two methods, each of which has its peculiar advantages. Where time is not an object, as far as duration of the process is concerned; and also in point of economy of labor and materials, the first may be adopted. Where it is desirable to produce a solution that may be finished quickly by dialysis, the second process has the advantage, and, taken altogether, I believe it to be the best.

The first consists in adding ammonia to a solution of perchloride of iron so long as the precipitate formed is redissolved. A solution is produced which contains ferric hydrate dissolved in ferric chloride, with free chloride of ammonium. Either the *Liq. Ferri Perchlor. fort.* B. P., or the *Liq. Ferri Chloridi*, U. S. P., may be conveniently used, and the liq. ammoniæ, sp. gr. ·959 or ·960, of either pharmacopœia, will be found a convenient strength. It will be remembered that this is made by adding to the strong ammonia of commerce about twice its bulk of distilled water. If the ammonia be added to the stronger solution of

iron considerable heat is evolved, and on cooling the preparation becomes gelatinized—often so much so that the vessel containing it may be inverted. It is better to avoid this result, and to this end the solution of perchloride must be diluted until of a specific gravity of about 1·300. This degree may be nearly enough approached by diluting two measures of the B. P. liquor with one of water, or adding one measure of water to five of the U. S. P. preparation. This solution will generally remain permanently bright and fluid. The amount of liq. ammon. required will of course vary with the acidity of the perchloride. The liquor ferri B. P. will sometimes bear as much as an equal volume. A gelatinized solution, even when made from the undiluted liquor, will often become fluid when put upon the dialyser; but, as I have said before, it is better to work with bright solutions.

The second method consists in adding to either solution of the perchloride a quantity of recently-precipitated ferric hydrate. Mix any given quantity of the liq. ferri with about five times its bulk of water and add excess of liq. ammon., also diluted with water. I think a more soluble hydrate is produced when the iron is added to the ammonia, as remarked in the case of the hydrate precipitated from the persulphate; but, in order to proceed in this way, it is necessary to know, approximately, the amount of ammonia required. The precipitate should be washed well, by decantation, with several waters, and then thrown upon a filter to drain for a short time. It may then be dissolved, by the aid of a gentle heat, in as much strong liq. ferri as may be required for solution. The exact quantity cannot be stated, but in no case will it exceed the volume of the liquor precipitated, and sometimes only one-fourth of this amount will be necessary. The solution is now ready for dialysis.

With the majority of pharmacists the dialyser will have to be extemporized out of such materials as may be at hand. The hoop may be a bell jar, an inverted glass funnel, or what is even simpler and handier, made from one of the flat hoops of an ordinary flour barrel. This may be smoothed a little with a knife or sand paper, and made to the required diameter—10 or 12 inches is a convenient size, if much larger the dialytic septum is liable to belly in the center, and thus make the layer of liquid too deep at that point.

Parchment paper is generally used for forming the septum. This is not the paper that stationers in this country generally supply under this

name, but a paper made less pervious, and strengthened by being dipped in sulphuric acid. Some of the strong and well-sized papers, as those used for legal documents, may be made to answer. It is absolutely necessary that there be no holes in the septum, and to ascertain this it is best to sponge with water the upper side of the paper, and then carefully examine the other side. If any drops appear the places should be marked and a little white of an egg may be applied, and coagulated by heat, or a drop of collodion or shellac varnish may be put upon the spot. Bladder, previously washed, may be used, and will be found to work well, especially if divested of its outer coat.

The septum should be two or three inches larger than the hoop, and should be secured around it with twine, not bound tightly, and the edge should be allowed to stand up around the hoop, so that if any liquid escapes through the joint or hoop it will be retained by the paper. The dialyser will now resemble a drum or sieve, and into this the liquid to be dialysed is poured to a depth of, at most, half an inch. It is then floated on the surface of some distilled water contained in a suitable vessel. If the hoop be of some heavy material it must be supported so that the septum is but barely below the level of the water.

The time required for dialysing either of the solutions whose preparation has been described will vary with the nature of the septum, its extent of surface, the depth of liquid, the frequency of changing the water beneath, temperature, and other conditions which need not be enumerated. If everything works well, and the water is changed daily, the process will be finished in one or two weeks. Distilled water is always preferable, and indeed necessary, especially for the first two or three days. Clean rain-water is the best substitute. The process may be said to be complete when the water no longer shows traces of chlorides, and the preparation becomes nearly tasteless, or at least not ferruginous.

A pig's bladder, completely filled with the iron solution, securely tied, and immersed in water, frequently changed, answers well for making this preparation. The process requires a longer time than with a carefully-regulated and properly-conducted dialysis, but it entails considerable less trouble. When I first tried this plan I was not aware that Professor Dragendorff, of Russia, had, some five years ago, suggested its application to dialysed iron. I can, however, corroborate all that he says. I may also mention that I think it an advantage to pro-

cure the bladder perfectly fresh, as it is then easily cleaned by pure water, and alkaline lye need not be used. Great care is necessary in tying the neck carefully. This can be best accomplished by a few turns of iron wire. Above this may be secured a piece of twine to suspend the bladder by means of a stick or rod, placed on the edge of the vessel containing the water. The bladder should be perfectly full and immersed altogether in water. The attraction of the solution for the water is so great that considerable pressure is manifested, and should any weak parts or holes be in the bladder the liquid will be forced out, water will take its place, and failure result.

As to the strength of the dialysed solution I can say nothing, except that with care, and by using the solutions above-mentioned, it may be kept over 5 per cent.—the quantity of oxide which appears to have been chosen as the standard. One hundred grains of the liquor should be placed in a tared capsule, and evaporated to dryness. The residue should weigh about 5 grains; if more, distilled water must be added in the calculated proportion; if less, the solution may be placed in a warm and dry place until reduced to the proper volume. If much heat is employed, and often in any case, the oxychloride of iron will be deposited as normal oxide, and the preparation will be spoiled. The evaporation of the solution may, as a rule, be considered a very unsatisfactory process, and every care should be taken to render it unnecessary. —*Can. Pharm. Journ.*, Oct., 1877.

A DRUG STORE IN THE FAR WEST.

By Louis Weiss, Ph.G.

The particular location of the store I am about to speak of is in a small, but by no means insignificant town, named Pueblo (after a tribe of Indians who first located there), on the Arkansas, in Colorado; the time from 1869 to 1872. The proprietor was a physician, a graduate of a western medical college.

Previous to this time, the store was in the hands of two physicians, both carrying on business outside of the store and practice. One was Notary Public and somewhat of a politician, the other was Postmaster, while a brother of his was telegraph operator or drug clerk, as occasion required. All these different branches were carried on in the store, a room about twenty-three feet by forty, in a one-story building, built of adobes (sun-dried brick). On the right hand side on entering the store was a case of glass front boxes; this was called the post-office department. On the left hand side was the telegraph office; back of these on each side, next the walls, was the stock of drugs, etc. These were in a dilapidated condition; no regard

was taken to keep them protected from light, heat, dust or moisture. Patent medicines were there an unknown luxury (?) at that time. Back of the store was a small room, termed the consultation room, into which the wily politician lured his victim, poured into his ears such floods of promises and into his glass such quantities of the enthusiastic beverage as none but the firmest could resist. This was about the state of affairs when my preceptor purchased the store and stock, in the year 1868. The post-office with the telegraph office were removed, and in order to make the store pay, the stock had to be enlarged and other goods added, which properly did not belong to the drug business. On my introduction to the store as an apprentice, I found a young man in charge from New York, the doctor having his time pretty well occupied in visiting patients, some of them living a distance of sixty miles from the store, in other small settlements. These trips were generally made on horseback, or per ambulance, and were of frequent occurrence, and on occasions would require his constant attendance for several days, the prevailing troubles being caused by six-shooters, wild bronchos, and last, but not least, cases of confinement. The first three months of my time were spent in learning the names of the different drugs and medicines, and in getting acquainted with the stock, which I found consisted of an innumerable variety of things, such as drugs, patent medicines, wines, liquors, cigars, tobacco, garden seed, paints, oils, varnishes, glass and other painters' material, fixed ammunition, fishing tackle, picture frames, moulding, cord and tassel, clocks, wall paper and trimming, window shades, coal oil, lamps, chimneys, brackets and chandeliers, stationery, playing cards, field glasses, and a variety of minor articles, some of which are, and most others are not, generally to be had in a drug store. The dispensing department was not so well stocked, but was up to the demand, which was generally confined to calomel, blue mass, sulphate of morphia, chloroform, copaiba, spirit of nitre, iodide of potassium and caustic. Valerian, bromide of potassium, sulphate of quinia, chloral hydrate were sometimes called into use. Elixirs, bitter wine of iron and like preparations were occasionally prescribed, but more frequently called for and sold over the counter. Many of the drugs that are in daily demand in Philadelphia never came into the store in my time. The stock was always bought in large quantities, as the goods were either bought in St. Louis, Chicago or New York—more frequently in New York when drugs proper, and in St. Louis when heavy goods—for the reason that it took from six weeks to two months from the time goods were sent for until they were received, as they had to be carried by wagon a distance of from two to three hundred miles, which was generally accomplished by Mexican bull trains; these were not always at hand, then the goods would lie in the warehouse until transportation could be procured. These trains consisted of from three to thirty wagons, each of which would load from two to four tons. Two of these wagons were coupled together, to the front one were hitched from ten to fifteen yoke of Texan or Mexican steers; these would be driven from eight to twenty miles a day or night, according to load, pasturage or water. This mode of transportation was quite expensive, which, in connection with the charges on the railroad, made freight come high, at times footing up eight dollars per hundred pounds gross, delivered at the door from New York.

New York would never receive more than two orders for goods, amounting to from

eight to twelve hundred dollars each, in one year, while St. Louis would not receive more than three in the same length of time. The price for medicines was not considered so extraordinary, though a prescription always brought four bits (fifty cents) at the lowest, no matter how small, or for what purpose; a four-ounce mixture, a dozen and a half of blue mass and colocynth pills, or a box of Seidlitz powders were considered settled for with six bits (seventy-five cents). Patent medicines, such as Ayer's pills, pain-killer (small), garg'ing oil (small) brought four bits, while the dollar preparations were paid for with one dollar and a half without grumbling. Coal oil sold for one dollar per gallon. Onion seed were worth their weight in gold; the mountaineer put his gold dust on one side of the scale, whatever amount he wanted to invest, and when it was counterpoised with onion seed it was considered he had value received. Even exchange was no robbery. The people were all very liberal in their dealings; ten cent customers were as scarce there as one dollar customers are here; less than ten cents' worth was not sold—ten cents or no charge was the rule.

The druggist and physician was looked upon as a somewhat superior being; his will was done, his word was law. Whenever there was a public meeting or a social gathering, it was not considered complete until the doctor was identified with it in some way. Many a meeting—political or for the organization of a fire company, base ball club, dancing club or church festival—was started in the store, subscriptions and donations received, and tickets sold for one or all, as the case might be. The doctor's name was always on the ticket for coroner; his services in that capacity were frequently called into use after there had been what they called a neck-tie festival. These were generally held after horses had been stolen and the aggressors caught by the Vigilantes.

In all the time that I was in the Far West I do not remember a single instance of a person asking for simply a dose of oil, as it is called here, the article not being put to use in that way.

Strychnia, arsenic, laudanum, or any other poisonous drugs were sold to any one that pleased to buy, and no questions asked. A friend of the doctor's at one time sent him a case of strawberries; these he was to sell for him merely as an experiment. They sold readily at one dollar per quart, and the individuals considered themselves favored at having the chance to buy, there not being enough for all. After that we had California grapes, pears and peaches for sale in their season, which brought six bits and one dollar per pound.

Everything is sold by the pound in that country, excepting eggs, liquids and dry goods. Water was sold at that time at two bits (twenty-five cents) per barrel, and was delivered from a tank on wheels or by placing a barrel on the forked branches of a tree, drawing it to the river by horse, filling and drawing back to place. This water was generally very muddy, and had to be allowed to settle or else be clarified by adding alum, before it could be used for ordinary purposes; the water obtained from wells being entirely unfit for use, as it is very alkaline.

The class of people we had to deal with were as various as were their wants, they coming from all parts of the country, Texas, New Mexico or the Colony, passing through our town on their way to the mines, and as a matter of necessity

would stop and replenish their stock of medicines, this being the only drug store within seventy-five miles or more around. All owners of sheep, horse and cattle ranches were purchasers of large quantities of medicines for both man and beast. The Indians and Mexicans would come, complaining of being muncho mala (very sick). If we took pity on poor Lo, and gave him a Seidlitz powder in separate doses until the froth came out of his mouth, he thought it a good joke, and would go off and return with another buck, who would likewise complain of being sick, and when treated in the same way would go and do likewise; and so on until the thing became monotonous. The Indians also frequently came to swap (trade) furs, pelts, skins and robes for paint; these in turn we would sell for cash. The Mexicans' wants were generally limited to blue ointment, agua dienta (whiskey), medicena per granis (medicine for itch), or pietra infernal (nitrate of silver). The arrival of a soda fountain and generator for the drug store created quite an excitement, and on the day the charging of the fountain for the first time took place there were a considerable number of spectators standing around the back of the store, where the performance was going on. As none of us had ever charged a fountain before, we made quite an awkward piece of business of it, and when the pipes got choked up with marble dust, necessitating our taking off one of the nuts, the marble dust and water were blown out with such violence that an alarm was given that the place had blown up, and a general stampede resulted. After we succeeded in making the soda water, we for several reasons found ready sale for it at fifteen cents per glass, or two bits a glass with a stick in it. The ice for our use we had stored ourselves, or, when such was not the case, bought and paid at the rate of three dollars per hundred pounds for the same.

Things were not alone in this shape in Pueblo, but Denver, the largest city in Colorado, had but little to boast of. With the coming of the railroad, things changed; goods could be had on quicker time and much cheaper, and a gradual improvement in the conducting of the drug business was noticeable. Whereas heretofore the proprietor's formula book had ruled supreme, it was now replaced by the United States Pharmacopœia, and preparations that were heretofore bought in the East we now prepared according to its directions. Prescriptions began to take the place of patent medicines, other physicians having located in the meantime. Goods not proper to the drug store were discarded as opportunities would permit, and replaced by a more complete stock of drugs. At the present time the drug business is carried on in a more legitimate manner in Colorado than in many of the Eastern States. Druggists get a good price for what they sell, and can afford to sell a good and pure article at the price, and such is the intention of the average druggist; when he fails to do so, it is in ignorance and not knowingly that the fraud is committed.

In no other part of the country can a thorough druggist and pharmacist apply his knowledge and ability to so good an advantage as in the Far West. There he has no wholesale stores at hand to send to, where he can get whatever he happens to want on the spur of the moment, but is thrown on his own resources and ability to manufacture.

VARIETIES.

Viburnum Prunifolium (*Black Haw*). E. W. Jenks, M.D. ("Gynæcological Transactions," 1876).—This remedy, used by the writer almost daily for several years, warrants him in speaking confidently in regard to results obtained from its use. Its most frequent use has been as a prophylactic against abortion. Of course the remedy is worthless when the abortion has already begun by detachment of the ovum. Where the habit of abortion has been formed the viburnum may be given in the form of the fluid extract from a half teaspoonful to a teaspoonful, four times a day, beginning two days before the regular menstrual date, and continuing it two days longer than the usual menstrual flow. In dysmenorrhœa with profuse menstruation and pain, except when the pain is due to stenosis or mechanical destruction, viburnum affords the patient great relief. The remedy should be given for several days in advance of the period, as well as during the time of the flow.

In spasmodic or neuralgic dysmenorrhœa it is not sufficient alone to give relief, but may be given with advantage combined with sedatives and antispasmodic remedies, such as cannabis Indica, camphor, hyoscyamus, and conium. In that form of dysmenorrhœa with menorrhagia, caused by fibroid growths, it has been given in combination with ergot, with gratifying results. The writer would designate viburnum prunifolium as a uterine sedative, whose action is as pronounced as is that of ergot in causing uterine contraction.

The form of the viburnum used is the fluid extract made from the bark of the root and bark of young shrubs, and newly-grown twigs. The dose is a half drachm to a drachm, repeated every two to six hours.—*Chicago Med. Jour. and Exam.*, Oct.

True Rhubarb.—The examination by Mr. E. M. Holmes of the root of *Rheum officinale*, grown at Banbury, does not confirm the view that it may be accepted as the true source of the Russian rhubarb of commerce. A plant three years old was dug up; the rootstocks, being trimmed, weighed on an average about 8¼ lbs, the central one 10 lbs. "When the outer portion was carefully sliced off (writes Mr. Holmes) in different parts of the rootstock and root, it *nowhere* presented the appearance characteristic of the true Russian rhubarb." On slicing the meditullium in like manner, there was no trace of the network which forms a marked characteristic of Russian rhubarb, and the following points of difference were observed: "The transverse section of the rootstock also is not so finely grained, and although it is marked with many stellate spots the markings are much larger and bolder than those of Russian rhubarb and, in fact, approach more nearly to the markings of English rhubarb. The sections of the true roots present only a radiate structure, without any stellate markings. In my opinion, the Russian root is produced by a plant which has a much less rapid growth than the noble *Rheum officinale*, Baill."—Sept. 8, 1877. From the above it would appear that the question has not been so definitely settled as some writers have supposed. The root forwarded to the late Daniel Hanbury, claiming to be a specimen of the true source of Russian rhubarb, was not that of *Rheum officinale*. Unfortunately, it arrived too late to be subjected to his admirable powers of investigation.—*Chem. and Drug.*, Sept. 15th, 1877.

MINUTES OF THE COLLEGE.

PHILADELPHIA, SEPTEMBER 24th, 1877.

The semi-annual meeting of the Philadelphia College of Pharmacy was held this day at the College Hall, No. 145 North Tenth street. Dillwyn Parrish, President, in the chair. Twenty-eight members present.

The minutes of the last meeting were read, and, on motion, approved.

The minutes of the Board of Trustees since the last stated meeting of the College were also read by the Secretary of the Board, and, on motion, adopted.

These minutes show that in July last a report was received, and adopted, from a

committee previously appointed by the board to consider and mature a plan for the representation of this College at the International Exposition, at Paris, in 1878.

The committee state "that they have selected nearly two hundred drugs, which are used more or less in the United States, and are derived from plants indigenous or naturalized in this country, but not found in Europe. These are deemed as very well adapted for exhibition. The committee propose to obtain for the purpose suitable receptacles for the specimens, and suggest that the whole collection be exhibited in Paris in 1878."

"The Committee propose to put up similar collections in the same style, with the view of presenting them to other societies for the purpose of exchange, and to some institutions where it is believed they will be acceptable and well cared for. The following societies and institutions have thus far been considered in connection with this plan. Pharmaceutical Society of Great Britain; Apothecaries' Society, at Berlin; Escuela de Farmacia (Prof. Herrera), Mexico; Apothecaries' Society, at Vienna; Pharmaceutical Institute (Prof. Flückiger), Strasburg; University of Tokio, Japan (Dr. Nagayo); Pharmaceutical Institute (Prof. Dragendorff), Dorpat."

"The committee further propose that the College enter into correspondence with the following gentlemen and societies:

"Theodore Peckolt, Rio de Janeiro (Brazil); Dr. Gastinel Bey, Cairo (Egypt); Prof. X. Landerer, Athens (Greece); Prof. Dymock, Calcutta (India); Joseph Bosisto, Richmond, Melbourne (Victoria); and Sociendad de Farmacia Argentina, Buenos Ayres; requesting from each a collection of drugs indigenous to or peculiar to his country, and offering to exchange American drugs for such collections. The committee would state that the three gentlemen first named are corresponding or honorary members of the College, and they believe that the others would willingly further the object of the College."

The subject under consideration at the last meeting relative to the exemption of all members of the College, of twenty-five years standing, from their annual contributions, and which was laid over under the rules, was again considered and discussed. Messrs. Bullock and Maisch advocated the adoption of the report of the committee, including the proposed amendment to the By-Laws. Other members coinciding in the measure, a motion was made to adopt the report of the committee, which was unanimously agreed to. By this action, the amended By-Law of the College will hereafter read as follows:

Chapter VIII, Article III. Members may reside in any part of the United States, and, upon election, shall pay an initiation fee of five dollars, and thereafter a contribution of five dollars annually, in advance, until the expiration of twenty-five years, when their annual contributions shall cease.

The President, in conformity with the resolution passed at the last meeting, announced the committee selected by the officers to revise the United States Pharmacopœia, as follows:

To the Philadelphia College of Pharmacy:

The committee appointed to select eighteen members of the College to take in charge the subject of the United States Pharmacopœia for its decennial revision in 1880, addressed a circular to such members as they deemed suitable for the service, and have received acceptances from the following gentlemen: Thomas S. Wiegand, Alfred B. Taylor, Joseph P. Remington, Israel J. Grahame, Wallace Procter, Edward Gaillard, William C. Bakes, John M. Maisch, William B. Webb, Robert F. Fairthorne, James T.

Shinn, Charles L. Mitchell, Charles C. C. Spannagel, Howard G. Jones, Alonzo Robbins, Samuel Campbell, Dr. A. W. Miller, Samuel S. Bunting.

Signed, DILLWYN PARRISH,
Chairman of Committee.

Philadelphia, Ninth mo. 24, 1877.

The members of the committee were all present, and accepted the trust confided to them.

Professor Remington moved that the name of Charles Bullock be added to the committee, which, meeting with the approval of the meeting, he was unanimously appointed to the service.

In the absence of Dr. Pile, Dr. A. W. Miller, on behalf of the delegates to the American Pharmaceutical Association, which met in Toronto, in September last, made the following report:

To the Philadelphia College of Pharmacy:

The delegates appointed to attend the meeting of the American Pharmaceutical Association at Toronto, Ontario, respectfully report that they were present on that occasion, and participated in the interesting discussions. The sessions were held in the City Council Chamber of Toronto at the appointed time, this being the first occasion on which the American Pharmaceutical Association has stepped beyond the boundaries of the United States. There was even more than the ordinary degree of interest attached to the meeting.

We can all bear testimony to the generous hospitality and uniform courtesy of our Canadian members and friends. We were invited to and shown through the Toronto University, which is said to be the finest specimen of Norman Gothic architecture on this continent. A very enjoyable *conversazione* was also provided for the visitors and their ladies at the rooms of the Educational Department, during which choice songs were interspersed with impromptu addresses, with the inspection of the rich storehouses of the appliances for teaching, and with the partaking of refreshments. In accordance with good old English custom, we united, at the conclusion, in hearty cheers "for a most estimable lady, Queen Victoria." The ceremonies were efficiently conducted by William Elliot, President of the Ontario College of Pharmacy.

A majority of the members visited many places of interest on the journey to Toronto, as well as on the return trip, embracing Watkins' and Havana Glens, Rochester, Niagara Falls, Montreal, Quebec, Lake George, Saratoga and Albany. The journeys over Lake Ontario will be memorable events with most of our companions, on account of the peculiar associations connected therewith.

The meetings were graced by the presence of several of our elder and most highly esteemed members, among them Dr. Squibb, Prof. Israel, J. Grahame and others. There was a very fair attendance throughout, though there were, perhaps, not as many new members elected from the immediate vicinity of the place of meeting as usual. Quite a number of interesting and valuable papers were read and discussed during the various sessions.

The following new officers were elected to serve during the ensuing year: William Saunders, of London, Ontario, as President; Ewen McIntyre, of New York, as First Vice President; John Ingalls, of Macon, Ga., as Second Vice President. Atlanta, Georgia, was chosen as the locality for the next annual meeting.

In conclusion, we are grieved to report the very sad misfortune which befel our honored Chairman, Dr. Wilson H. Pile After having actively participated in the session on Thursday afternoon, he was suddenly affected by hemiplegia, shortly after midnight, the paralysis extending to the entire left side of his body. At the latest accounts he is very slowly improving, so that he will probably soon be able to endure the fatigues of the homeward journey. Respectfully submitted,

ADOLPH W. MILLER,
on behalf of the delegates

September 24th, 1877.

Prof. Maisch, Chairman of the delegation to attend the conference of the various Schools of Pharmacy, held at the some time and place, made the following report:

To the Philadelphia College of Pharmacy:

The undersigned delegates beg leave to present the following report:

The eighth Conference of Schools of Pharmacy was held in the Rossin House, Toronto, Ont., on the morning of September 4 and on the evening of September 6, 1877, delegates being present from the Philadelphia, New York, Massachusetts and Louisville Colleges of Pharmacy. Mr. A. E. Ebert was invited to represent the Chicago and Mr. E. Eareckson to act for the Maryland College of Pharmacy,

from which institutions credentials had failed to reach the Conference. The officers of the preceding year were re-elected, Mr. Chas. A. Tufts president and John M. Maisch secretary.

The subjects for discussion, prepared by the Colleges of New York and California, referred to regulations concerning the admission of students, examinations and requirements for graduation, with the view of making them as uniform as possible in *all* the Colleges. The various propositions were freely discussed, and afterwards adopted in the following form, the votes being in nearly all cases unanimous:

1. The matriculation and lecture tickets shall be taken out by each student in person, and must be endorsed, the former within fifteen, the latter within thirty days, from the beginning of the lecture course.

2. One course of lectures attended at another recognized College of Pharmacy or corresponding institution where the same branches are taught—there being no regular College of Pharmacy in the same locality—shall be accepted as such, but the last course shall always be taken at the College where the student intends to graduate.

3. At the time of the final examination for the degree of Graduate in Pharmacy the candidate must have had at least three and a half years' practical experience; but he shall not receive his diploma until he shall have completed the term of four years' service.

4. Candidates for graduation shall be subjected to a written or oral and a practical examination.

a. The examination shall embrace questions in theoretical and pharmaceutical Chemistry, Botany, Pharmacognosy and Materia Medica, a knowledge of the U. S. Pharmacopœia, of the various systems of weights and measures, of the maximum doses of powerful remedial agents, of the antidotes to poisons, and the translation of Latin prescriptions.

b. The practical examination should comprise the analysis as to identity and purity of simple medicinal chemicals, the actual compounding of prescriptions requiring skill and judgment, the identification of specimens in the several departments, and the making of chemical and pharmaceutical preparations.

5. No special examinations shall be held, but only one regular examination at the end of the regular course.

6. Candidates must present an original thesis, written in English, and also pass their examination in English.

7. Certificates will be granted to all candidates under twenty-one years of age who have passed a satisfactory examination, setting forth this fact. On producing evidence that they have complied with all the requirements as to time of service and age, they shall receive their diploma as Graduates in Pharmacy.

A proposition, fixing the percentage of merit marks obtainable as necessary for graduation, was indefinitely postponed as being impracticable; but it was agreed that examination papers from the various Colleges be selected for comparison at the next annual Conference, to ascertain the views and judgment of the examiners as to the requisite knowledge for passing and rating the candidates. The Philadelphia College was requested to make suggestions to the other Colleges.

The Colleges of Massachusetts and St. Louis were selected to prepare questions for discussion at the next Conference.

The ninth Conference of the Schools of Pharmacy will convene at Atlanta, Ga., September 3, 1878, at 10 oclock A. M., preceding the first session of the American Pharmaceutical Association.

Respectfully submitted,

JOHN M. MAISCH.
JOSEPH P. REMINGTON.
CHARLES BULLOCK.

Mr. Bullock presented a photograph of William Elliot, President of the Ontario College of Pharmacy, which was accepted with thanks.

Professor Maisch called the attention of members to the death of Hugh A. Weddell, M. D., an honorary member of the College, which occurred at Poitiers, France, July 22d, 1877. In his remarks Professor Maisch alluded to his services as an author, and to his botanical investigations of the Cinchonas, the substance of which remarks will be found in an obituary notice on page 528, of this volume.

This being the semi-annual meeting, an election for eight trustees and a committee of three on deceased members was ordered. E. M. Boring and Charles L. Mitchell, acting as tellers, reported the following gentlemen elected to the respective positions, viz.:

Trustees—Dr. Wilson H. Pile, William C. Bakes, William McIntyre, Albert P. Brown, Edward C. Jones, Richard V. Mattison, Robert England, Dr. A. W. Miller.

Committee on Deceased Members—Charles Bullock, Alfred B. Taylor, Joseph P. Remington.

There being no further business, on motion, adjourned.

WILLIAM J. JENKS, *Secretary.*

MINUTES OF THE PHARMACEUTICAL MEETING.

Pursuant to notice, the first pharmaceutical meeting of the session was held October 16, 1877, and organized by calling Vice President Chas. Bullock to the chair, when the meeting elected T. S. Wiegand Registrar.

Prof. Maisch moved a vote of thanks to Mr. McIntrye for his long and very satisfactory services as Registrar; the motion was carried unanimously.

In order to render these meetings more generally useful by uniting all classes of the trade, it was recommended that the Registrar should notify all druggists and apothecaries in the city of the time and place of their occurrence.

The reading of the minutes of the previous meeting (May last) was, on motion, dispensed with.

Prof. Maisch presented, on behalf of the Smithsonian Institute, the report of the regents for the year 1876, also, from Mr. J. J. Brown, of Oakland, Cal., a graduate of the college, a pair of bulbs of the Chlorogalum pomeridianum, Amolia, the California soap-root, remarkable for the large percentage of saponin which it is said to contain, as also for a peculiar mucilage; these two constituents caused the Indians and early Spanish settlers to esteem it very highly as a detergent; and so efficient and harmless it is that it is still preferred for washing laces, embroideries and such like fabrics, to any soap attainable. A cold infusion of the bulb may be used in place of soap as a dentifrice, a shampoo liquid, and a valuable lotion for both face and hands. But little use has been made of it in medicine, although it is claimed to have some virtue when employed as a lotion to ulcers and in skin diseases; the fibres have been separated from the bulbs, by the Chinese, washed, dried and put in the market for making *hair* mattresses. The plant grows abundantly upon the dry hillsides of the Pacific coast, from Oregon to Central America, and perhaps further south; but as its flowers open at night time Mr. Brown has not been able to obtain them.

Mr. R. V. Mattison presented to the notice of the meeeting a suppository mould from Messrs. Benton, Myers & Co., of Cleveland, Ohio; the price at which the moulds are sold is $8, but the weight of the suppositories, made with them, is only about twenty grains for the large, and twelve for the small size; this forms an objection, as the Pharmacopœia directs suppositories to weigh thirty grains, which was regarded by several members more than necessary and desirable. The cold process, forcing the mixed material into the moulds, thus saving time and securing uniform division, was regarded by some as preferable to mixing while heated. Prof. Remington recommended Blackman's mould on occount of the economy of ice.

Mr. L. R. Carbonel, a graduate of the college, presented through Prof. Remington, several pods of the Theobroma cacao, the seed vessels of Bixa orellana, from which plant anatto is obtained; and some seeds of the Castor Oil plant, cultivated in Cuba. Also specimens of a plant, which Prof. Maisch stated to be an Eupatorium, and which is used is Cuba both as a purgative and emetic; for the first purpose in about 30 grain doses, and double as much for an emetic.

On behalf of Mr. Neppach, a student of the college, Prof. Maisch presented a specimen of genuine Oregon Balsam of Fir, which is probably the product of Abies menziesii, *Lindley*, a tree growing from Sitka to California and Colorado, and generally known under the name of *balsam*. The factitious so-called Oregon balsam of fir, which was described by Prof. Maisch before ("Amer. Jour. Phar.," 1874, p. 106), was exhibited alongside of the genuine article, and observed to be of a darker color and a terebinthinous taste, while the new article resembled Canada balsam in color and transparency, and had an agreeable, somewhat different aromatic odor. Mr. Neppach stated that the oleoresin brought by him was not an article of commerce in Oregon, where balsam of fir was procured from the eastern section of the continent; but having noticed the statement of Prof. Maisch in 1874, he obtained the sample in Oregon by puncturing the small vesicles which formed on the bark of the balsam tree of the Pacific coast. Several members who had recently visited Canada described the formation of these balsam vesicles on the trunks of Abies balsamea, and the manner of obtaining the oleoresin, as reported by Mr. Wm. Saunders at the recent meeting of the American Pharmaceutical Association.

Mr. Bullock presented samples of Goa powder and chrysophanic acid which have attracted a good deal of attention in Europe for the last year, and have been largely used and with success in treating cutaneous affections, combined sometimes with an alkali and sometimes with acetic acid. He read a paper on this subject (see page 545), which was a summary of the literature, both pharmaceutic and medicinal, and was referred to the Publishing Committee.

Prof. Remington read a paper by Mr. Henry Trimble (see page 536) upon the use of chlorine water and ammonia as a color test for estimating quinia. Prof. Maisch said that he was glad Mr. Trimble had not overlooked the fact that quinidia produced a very similar reaction, and then commented on the common statement, that the presence of chlorohydric acid prevented the appearance of the green coloration, which he stated to be erroneous, the point necessary to a successful result being the presence of sufficient chlorine before the ammonia is added.

Mr. Boring called attention to samples of caraway, the want of flavor of which first called attention to its inferiority; when sieved about 38 per cent. of very small and immature fruits, almost devoid of taste, were separated, the remainder being better, but still inferior to an unobjectionable article; the same remark applies to most of the anise now offered for sale.

Professor Remington read a communication from Mr. Fox, relating to greater uniformity of charges for prescriptions, and to the propriety of pharmaceutists adopting a uniform mark for valuation. After some discussion, a motion by Israel J. Grahame prevailed—that it was inexpedient to take any action upon it.

Mr. Bullock called attention to two samples of heavy powders sent him by a

gentleman prospecting in Nevada, one of which proved to consist of quartz, aluminous earth and iron, the other of the sulphates of iron and alumina, entirely soluble in water, and most likely a product from the decomposition and oxidation of the first-mentioned mineral. The finder, judging from the weight of the material, thought it might prove to be a source of supply for some of the precious metals, in which opinion he was of course disappointed.

There being no further business, on motion, adjourned.

T. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

The Colleges of Pharmacy, so far as they have been heard from, have all large classes, and in several, if not in all, the number of students is in advance of former years. In the Philadelphia College it became necessary to provide additional accommodations, by putting into the lecture rooms another row of benches. We also learn that laboratory instruction is sought by a larger number than heretofore, and that many will avail themselves of the practical instruction in pharmaceutical manipulation, as organized for the present session in Philadelphia.

Social Meeting of the Alumni Association of the Philadelphia College of Pharmacy.—The second series of these meetings was inaugurated October 4th, 1877, by President Mattison, who, in an address of welcome to the forty odd members present, explained their objects, and what it was hoped would be accomplished by them.

The committee appointed to furnish matter for discussion reported through Messrs. Kennedy and Trimble, the former introducing the subject of aloes, and giving some interesting facts in connection with its extraction with hot and cold water, and the relative efficacy of the products. The latter gentleman read a paper on Nitric Acid (see page 537), in which a method of increasing its strength for use in the process for gun cotton was described. He also offered for the inspection of the students a number of specimens.

A paper read by the president, entitled "What to Study and How to Study it," was listened to with attention by the meeting, which, on motion, then adjourned to meet November 1st, 1877. WALLACE PROCTER, *Secretary.*

EDITORIAL DEPARTMENT.

The excursions to and from Toronto, on the occasion of the last meeting of the American Pharmaceutical Association, have been so pleasant that they will be long remembered by those who participated in them. The routes led through a section of the continent which, in point of natural beauties and picturesque scenes, has few rivals.

Wednesday, August 29th, a party left Philadelphia by way of Harrisburg and Williamsport, being joined by others on the route, which led up along the Susquehannah and over northern branches of the Alleghanies into that beautiful valley into which Havana and Watkins' Glens open, and where Seneca Lake spreads its silvery sheet of water. After a day's travel the comfortable quarters of the Glen Mountain House, located on the cliff near one of the numerous cascades of Watkins' Glen, were reached. The clear weather favored the evening and early morning promenades to the neighboring points, from which delightful views are obtained, and the exploration of the winding gorges and circular basins of Watkins' Glen, and the abrupt and angular turns of Havana Glen. Earlier than originally contemplated, the party left this pleasant retreat on Friday noon to make room for other guests, and, after a charming sail on Lake Seneca to Geneva, took the railroad to Rochester, where their fellow-member, Mr. G. H. Haas, showed them the most friendly attentions, and enabled them to see as much as possible of that thriving and beautiful city.

Niagara Falls and the headquarters at the Cataract House were reached on Saturday afternoon, and during the following night the party was joined by others from various sections, among them a large party who had left New York on Thursday and Friday, and traveling up the Delaware valley and down the upper course of the north branch of the Susquehannah, had stopped at Watkins. The early risers a Niagara were rewarded with the sight of a clear sky, and a beautiful, ever changing rainbow rising high up above the mist of the mighty Fall. Later in the forenoon, Prospect Point was a favorite station of observation to view the rainbows, which fluttered in the gorge of Niagara River through the spray below the Falls, and throughout Sunday and Monday numerous expeditions were undertaken to the various points of interest in the neighborhood.

The members who had business to attend to at Toronto on Tuesday before the opening of the sessions left Niagara Falls on Monday, reaching Toronto by steamer after a sail across Lake Ontario, which to some was rendered less delightful than it would otherwise have been, by sea sickness, the effects of which were soon forgotten in the hospitable halls of the Rossin House, where the headquarters had been established, and where on Tuesday they were followed by the majority of the visiting members with their ladies.

The pharmacists and druggists of Ontario had very thoughtfully planned a series of entertainments, which were as liberal on their part as they were pleasing to the recipients thereof. On Tuesday forenoon they invited the visitors who had arrived, and most of whom were, by their duties, subsequently deprived of the opportunity of seeing the city, to a drive to the most important public institutions, which were afterwards also visited by the other visitors. On Wednesday evening, September 5th, a very pleasant entertainment was tendered to the Association by their Ontario friends in the Normal School buildings, where they had an opportunity of examining the liberal collections of scientific instruments, works of art, and other means of instruction, and, aside from the refreshments, were treated to an excellent vocal and instrumental concert, highly enjoyed by all. The buildings and grounds had been kindly opened for the purpose by the Department of Education of the province of Ontario.

After the adjournment of the Association, most of the visitors left Toronto on Friday afternoon for the St. Lawrence River and Montreal, but a goodly number availed themselves of the opportunity afforded them by their Canadian brethren to visit one of the most picturesque sections of their country, the primæval beauty of which has scarcely been interfered with by the axe of the settler. Traveling by rail along Lake Simcoe and several smaller lakes, the party left the cars at Gravenhurst and embarked on a steamer which carried them over Lakes Muskoka and Rosseau, at the northern end of which they obtained very fair accommodations at the Rosseau House. Both lakes, but more particularly the former, are bestudded with hundreds of rocky and densely wooded islands, nearly all of which are uninhabited; it occurs rarely that the smoke from a chimney or a camp-fire is observed, or that the stillness is broken by busy scenes on the shore. But the view changes continually, and the dark-colored but transparent waters reflect like perfect mirrors all surrounding objects and at night the stars, which glisten and twinkle with great beauty through the clear atmosphere. Muskoka and Shadow rivers were particularly admired for the perfect reflection of the multitudinous forms and colors of the shrubs and trees, which, decked with their autumnal foliage, lined the shores.

After some days of rest in this highland and lake region, the party returned to Toronto and followed those who had preceded them, by steamer down Lake Ontario and the St. Lawrence River, past the Thousand Islands, and through the several rapids to Montreal, and some further on to Quebec. Leaving Montreal, Lakes Champlain and George, with their elegant surroundings, were reached. Saratoga and Albany were visited, and on the trip down the Hudson and past the Catskill Mountains the romantic scenery of the highlands was admired, and the excursionists returned to their homes, hoping for a similar reunion on the occasion of the next annual meeting.

During the entire trip nothing had occured to mar the pleasure, except the serious illness of Dr. W. H. Pile, which kept him confined to his bed at the Rossin House, Toronto, until two weeks ago he had so far recovered from an attack of paralysis, as to be able to bear the fatigue of the journey to his home in Philadelphia, where we are pleased to state he is gradually improving. Another member, who with his family heartily enjoyed the excursion, Ashel Boyden, of Boston, we are sorry to learn, has unexpectedly departed this life.

The Preliminary Revision of the United States Pharmacopœia.—As the period is drawing near when the decennial convention, for the revision of the pharmacopœia, is to meet, the various societies who are interested in that work are making preparations for collecting suggestions of improvement. Heretofore there has been little uniformity in preparing these suggestions for the proper use of the Committee of Revision; not unfrequently, they were very fragmentary and sometimes consisted merely of references to articles published in various journals. To be really useful for the purpose for which they are intended, they should be presented in a form designed for transfering them to the pages of the pharmacopœia, which would very materially facilitate their comparison with others of a similar nature, particu-

larly, if the reasons for the suggestions or propositions were briefly stated. If worked out in such a manner, such a preliminary revision must necessarily embrace the entire pharmacopœia, and to make it thus complete should be the aim of every society, as it has been done heretofore by a few only, and as it has been contemplated by the American Pharmaceutical Association at the last meeting in the appointment of a pharmacopœia committee. The fact that its members are scattered throughout the country, places this committee at a great disadvantage, since they can meet but very rarely, and the intercourse of most of them must necessarily be by letter. Its labors, however, may be materially lightened by the local organizations, if they will likewise go actively to work at the preliminary revision and remain in communication with each other and with the committee of the national association, exchanging views on the general principles which should be observed in the new pharmacopœia, and on the changes in the processes which appear advisable.

The special committee appointed by the Philadelphia College of Pharmacy has organized by electing Mr. A. B. Taylor chairman and Mr. Wm. C. Bakes secretary, and commenced the work in earnest. The committee of the American Pharmaceutical Association, of which Mr. Chas. Rice, of New York, is chairman, has also taken steps, and the latter has issued a circular, inviting attention to the general principles proposed to be followed in reviewing the pharmacopœia, and which may be briefly stated as follows:

1. To abolish the present division into a primary and secondary list and preparations, and to arrange all articles in *one* alphabetical order only, whereby such natural groups as Aquæ, Extracta, Pilulæ, etc., would be retained.

2. To have the Pharmacopœia too full rather than deficient, and to propose a list of remedies to be discarded.

3. To propose crude drugs, chemicals and pharmaceuticals for admission.

4. To add to all crude drugs concise descriptions, and to notice common admixtures or sophistications; also to accompany the botanical name of each plant with the name of the botanist and of the natural order.

5. To describe chemicals and define them by tests of identity and purity, and to give processes only where differences of preparation may produce different results.

6. To express temperature by degrees of both Centigrade and Fahrenheit.

7. To give the formulas and atomic weights of chemicals.

8. To abandon measures of capacity, and express all quantities in parts by weight only.

9. To give for all officinal articles the average single and daily adult dose, and when of peculiar effect upon infants, also the maximum dose for infants.

10. To introduce tables of the maximum doses of powerful remedies; of poisons and antidotes; of solubilities in water and alcohol; of specific gravities of alcohol and other liquids; of volumetric and other reagents; of the relationship between weight and measure of all officinal liquids; of the chief constituents of important mineral waters; of the relative strength of powerful galenicals as recognized by foreign Pharmacopœias used in this country, and of the differences in strength as made by the present and revised Pharmacopœia.

It is hoped that the pharmaceutical and medical societies will discuss these and other points which may occur to them, and cause their suggestions and criticisms to be communicated to others, or to confer with other bodies having the same interest at heart. The latter course has already been inaugurated in Philadelphia.

Corrections.—In the last number (p. 517) we expressed our regret that Dr. C. A. Robbins had not exhibited at the meeting of the American Pharmaceutical Association a sample of *veratridia* isolated by him from the rhizome named. We have since learned that a sample was on exhibition, but we failed to see it.

On page 508, second line from top, read "and in other parts of *Eastern* (instead of Western) Brazil."

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Medicinal Plants; being Descriptions with Original Figures, etc. By Robert Bentley, F.L.S., and Henry Trimen, M.B., F.L.S. Philadelphia: Lindsay & Blakiston. 4to. Price $2 per part.

Of this valuable work, with its handsomely executed plates and complete descriptions, we have now before us part 19, containing Cassia obovata, C. acutifolia, C. angustifolia, Cornus florida, Arnica montana, Colchicum autumnale and Gelsemium sempervirens. Part 22 contains Anthemis nobilis, Arachis hypogæa, Ipomœa Nil (the kaladana of India, where the seeds are used as a cathartic), Lolium temulentum (darnel), Mentha pulegium (the European pennyroyal), Sambucus nigra and Zea Mays. In part 23 we find Anacyclus officinarum (German pellitory), Andrographis paniculata (maha-tita of Bengal, used as a tonic), Cannabis sativa, Cimicifuga racemosa, Maranta arundinacea, Sesamum indicum and Toluifera balsamum.

An Index of Diseases and their Treatment. By Thos. H. Tanner, M.D. Second edition. Revised by W. H. Broadbent, M.D., Fellow of the Royal College of Physicians. Philadelphia: Lindsay & Blakiston, 1877. 8vo, pp. 432. Price, cloth, $3.

The volume being intended as a ready reference book, for the practising physician, convenience for consulting it has been the aim and carried out in its alphabetical arrangement. The first thirty pages are occupied by a tabular synopsis in which the groups of diseases are alphabetically arranged, and under each group the diseases belonging to it, enumerated with references to the text. The following 250 pages contain the "Index" proper. In each case the name of the disease is followed by the etymological derivation of its name, and by brief and practical accounts of the causes, symptoms, varieties and treatment. The remainder of the work consists of an "Appendix of Formulæ," which have been reprinted from the last edition of the author's "Practice of Medicine," and which, among others, include, also, a lengthy chapter on "Climates for Invalids," and one on "Mineral Waters." The editor has left the plan as designed by the author, but has carefully revised each section, to incorporate new knowledge and to render diagnosis more definite.

The Physician's Visiting List for 1878. Philadelphia: Lindsay & Blakiston.

This is the twenty-seventh year of the publication of this visiting list, a fact which speaks for its convenience and usefulness. It is gotten up in the usual good style.

Practical Hints on the Selection and Use of the Microscope. By John Phin, Editor of the "American Journal of Microscopy." Second edition. New York: The Industrial Publication Company, 1877. 12mo, pp. 181. Price, cloth, 75 cents.

Two years ago we noticed the first edition of this little work, and we now welcome the second, which is considerably enlarged, and contains numerous woodcuts, among them three or four of microscopes of as many manufacturers, in order to explain some of the devices. Intended for beginners, the little work will serve its purpose well as expressed in its title.

Outlines of Modern Chemistry, Organic; based in part upon Richel's "Manuel de Chimie." By C. Gilbert Wheeler, Professor of Chemistry in the University of Chicago. Chicago: Jansen, McClurg & Co., 1877. 12mo, pp. 231.

This little work is intended as an introduction into organic chemistry. Its arrangement is quite convenient for the beginner; but though it was apparently in part intended for the use of medical and pharmaceutical students, the information given is in many cases scarcely sufficient or accurate enough. Thus, opium is stated to be obtained from the *seeds* of the poppy; Veratria sabadillia and colchinia (?) are enumerated as constituents of Veratrum album besides jervia, while the occurrence of veratria in sabadilla seed is not mentioned, or of jervia in our Veratrum viride. Digitalin, picrotoxin and cantharidin are classed with the alkaloids, and the interesting alkaloids berberina, sanguinarina, etc., are not even mentioned.

Distribution des Prix aux Elèves internes en Pharmacie des Hôpitaux. Paris, 1877. Pp. 30.

Distribution of Prizes to the Pharmaceutical Intern Students of the Paris Hospitals.

We are indebted to Mr. Stan. Martin for a copy of this pamphlet.

OBITUARY.

ASHEL BOYDEN died at his residence, in Boston, October 22d. He was born in Walpole, Mass., October 31st, 1810, learned the apothecary business at Medford and began business with his brother Arnold in 1830 in a locality now occupied by the Cochituate water reservoir, and in the vicinity of his last store. He was devoted to the business of his choice, and an earnest advocate of pharmaceutical progress. He was a member and for some time President of the Massachusetts College of Pharmacy, joined the American Pharmaceutical Association at its first annual meeting, in 1853, served one term as its treasurer, and for a number of years has been a faithful attendant at its annual meetings, where his kind disposition secured for him numerous friends. The deceased leaves a widow and three children.